SEPTEMBER 6, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Statesmanship

✔ Labor Tries on Long Pants, p. 49

✔ NLRB Shifts Toward Center, p. 51

✔ Home Rule for Two Cities, p. 52

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WE HARNESS UNSEEN FORCES . . .

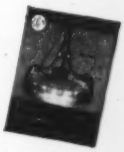
TO GIVE YOU GREATER LIFTING POWER!

The lifted load takes on a "new look" when you swing an EC&M Type SW ALL-WELDED MAGNET into operation. Each lift is wider . . . heavier . . . and a greater pay load.

This *greater* lifting power results from the EC&M all-welded design, which permits better space proportioning for magnet windings and eliminates load-limiting air gaps. When you turn on the current, invisible magnetic lines of force flow radially out from the center pole across the load and back into the magnet case through the outer pole ring. The magnetic path is constant . . . no air gaps at pole shoes.

Whether you are handling pig or scrap iron . . .or any other ferrous materials or products . . . there's an EC&M Type SW all-welded magnet to meet your individual requirements.

CHECK THESE FEATURES: EC&M Type SW all-welded magnets are sealed against moisture . . . inner and outer poles are welded for snug fit . . . pole pieces are renewable . . . wider working surface and bigger pay loads result from elimination of recesses for bolts . . . greater mechanical strength withstands rough handling and assures longer service life . . . maximum operating efficiency means substantial savings in time and results in top economy.



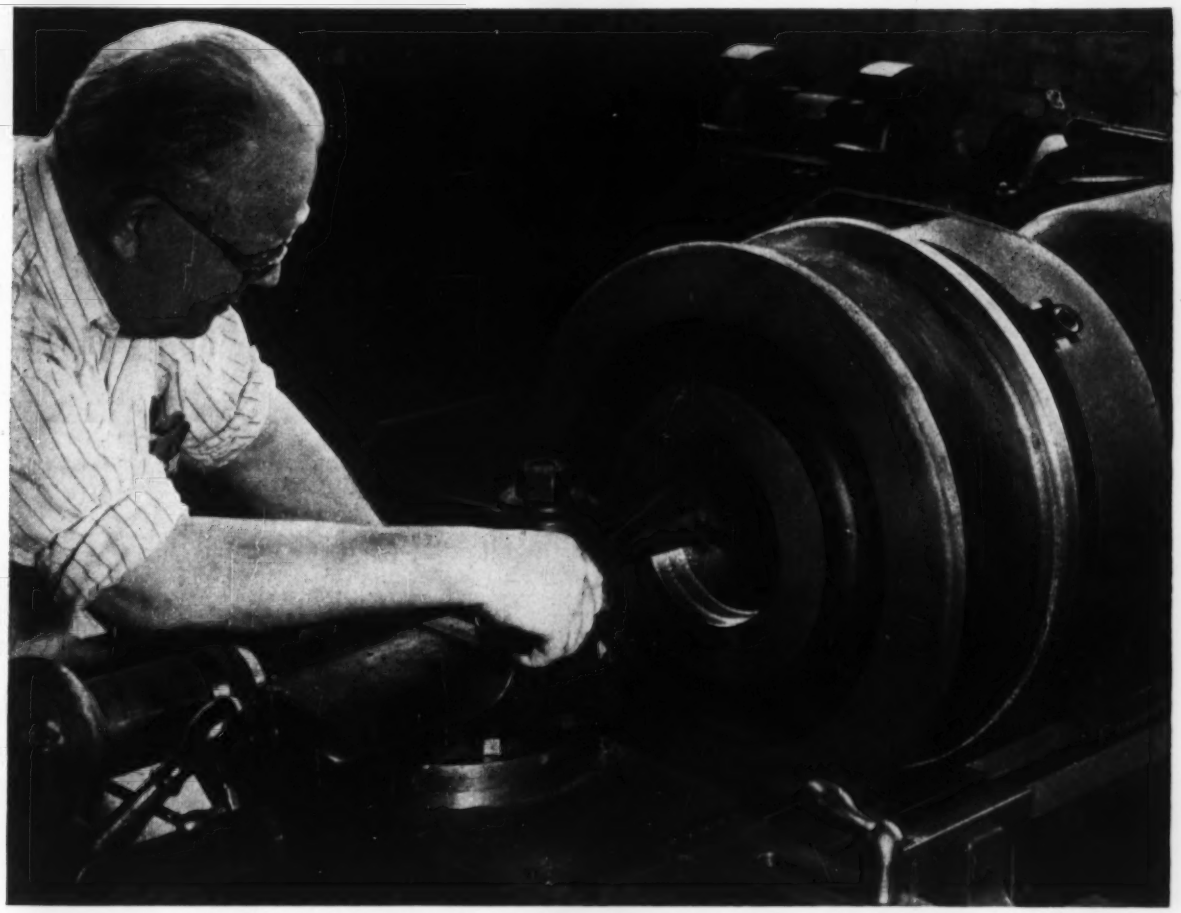
FOR DETAILS AND SPECIFICATIONS, WRITE TODAY FOR BULLETIN 900.

LIFT MORE FOR LESS WITH EC&M LIFTING MAGNETS!

1708

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street Cleveland 4, Ohio



Double-flanged wheel during machining at plant of Michigan Crane & Conveyor Company, Detroit.

The Number One Requirement Was Strength

That's a big, sturdy crane-track wheel in the photograph. It had to be strong to meet the top requirement of some very rigid specifications. In its original form, the wheel was a rough-machined blank, one of a number produced by Bethlehem's forging-and-rolling process for Michigan Crane & Conveyor Company.

Here the specifications called for double-flanged blanks of unusual ruggedness. Fast delivery was another consideration. Bethlehem blanks met all requirements in full, and delivery was made with plenty of time to spare. It was a good example of filling a customer's special needs in every detail, and filling them quickly.

Crane wheels, of course, are but one of the many uses for Bethlehem circular blanks. Available in a wide variety of sections, these sturdy steel blanks are produced by an exclusive process that combines the benefits of both forging and rolling. Their strength makes them entirely suitable for gears, sheave wheels, flywheels, turbine rotor wheels, and numerous other circular parts.

No doubt you could use such blanks to advantage in your own operations. We make them in a most convenient range of sizes—10 to 42 in. OD—and they can be furnished untreated or heat-treated, as specified. Call or write us for complete information.

BETHLEHEM
Forged-and-Rolled
CIRCULAR FORGINGS

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Seeing is Understanding

You'll see how the elimination of flanges and undercuts on the inner ring provides a *wider* contact area for the rollers.

This SKF Story Of Spherical Bearing Design Improvement

When SKF first announced that its *improved* (Type "C") Spherical Roller Bearing provides, size for size, up to 50% more capacity and 2 to 3½ times longer life than any other available design, most people asked:

"How was this done?"

Your SKF District Office has the answer, in the form of a clear, quick *visual* demonstration. Ask to see it—here, in outline, is what you'll see!

You'll see how much longer the Type "C" Rollers are than those in the original SKF design.

You'll see the way the rollers are *guided* by a separate floating guide ring, free to move axially.

You'll see the improved brass *window-type* cage—see why it's stronger and more effective.

SKF®

BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC.
PHILADELPHIA 32, PA.

YES—We'd like to have an SKF Representative SHOW us WHY the improved SKF Type "C" Spherical provides, size for size, more capacity and longer life than any available spherical design.

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Company .....

Address ..... *State* .....

You can see an exact comparison of original vs. Type "C" capacity and life in the sizes of sphericals you use.

Mail this coupon NOW and SEE why you can get better spherical roller bearing performance. No obligation, of course.

SKF INDUSTRIES, INC., PHILA. 32, PA.—*manufacturers of* SKF *and* HESS-BRIGHT® *bearings.*

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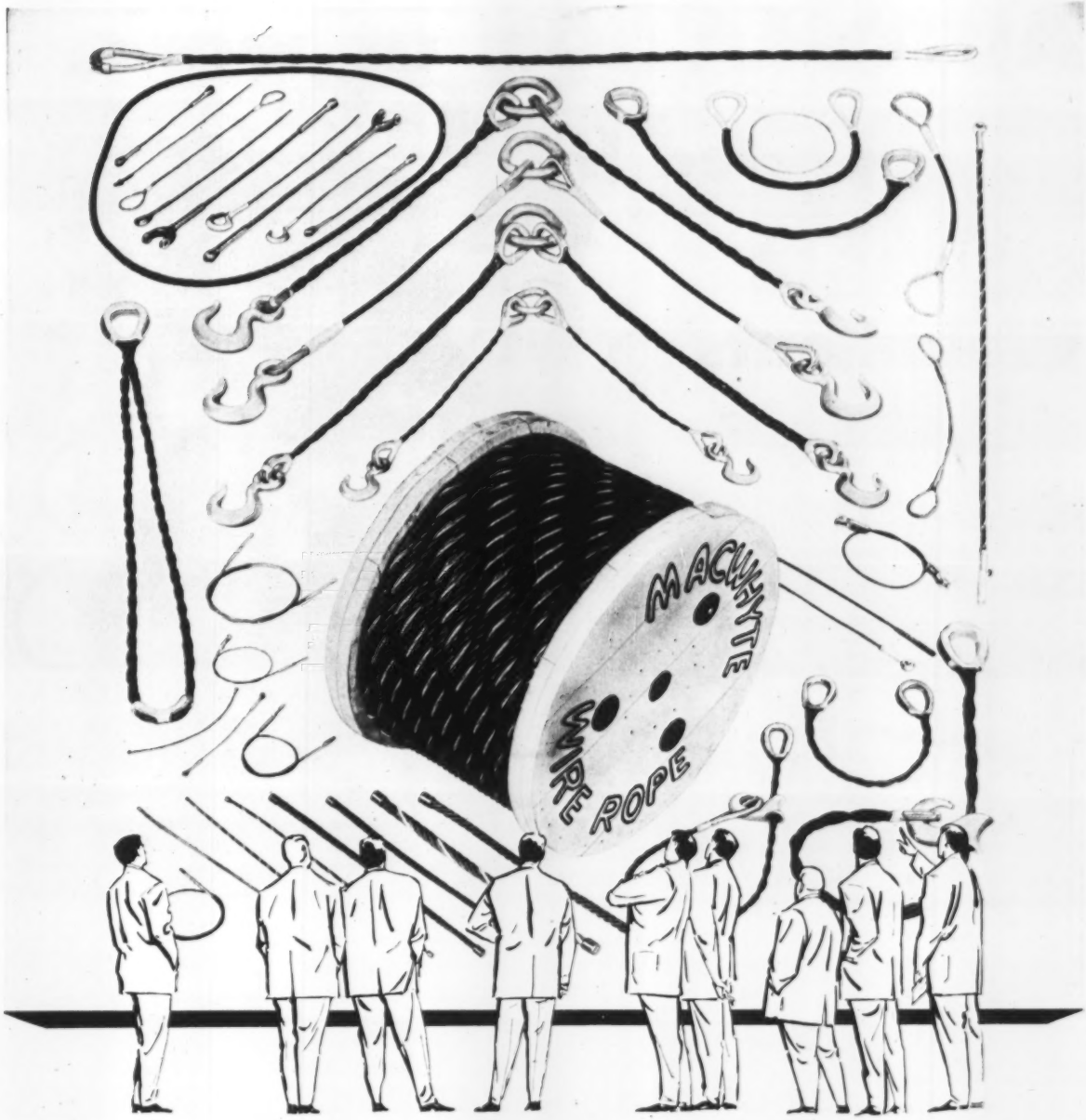

These ropes, slings, and assemblies provide a big selection for your needs

Shown above are Wire Rope products developed and manufactured by Macwhyte Company for maximum safety and economy. There are a thousand and one types and sizes of Wire Rope in Bright Steel, Galvanized Steel, Stainless Steel, and Monel Metal; hundreds of types and sizes of Braided Wire Rope Slings for materials handling; a wide selection of Wire Rope Assemblies for machine parts and controls; and Aircraft Control Cables, Assemblies, Terminals, and Tie-Rods for aircraft and other uses.

All these products are available from Macwhyte Company and distributors. Recommendations will be gladly furnished. A Macwhyte distributor will be pleased to serve you or write direct to:

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Galvanized, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. G-16 Wire Rope Catalog available on request.

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Chicago • St. Paul • Fort Worth
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Los Angeles

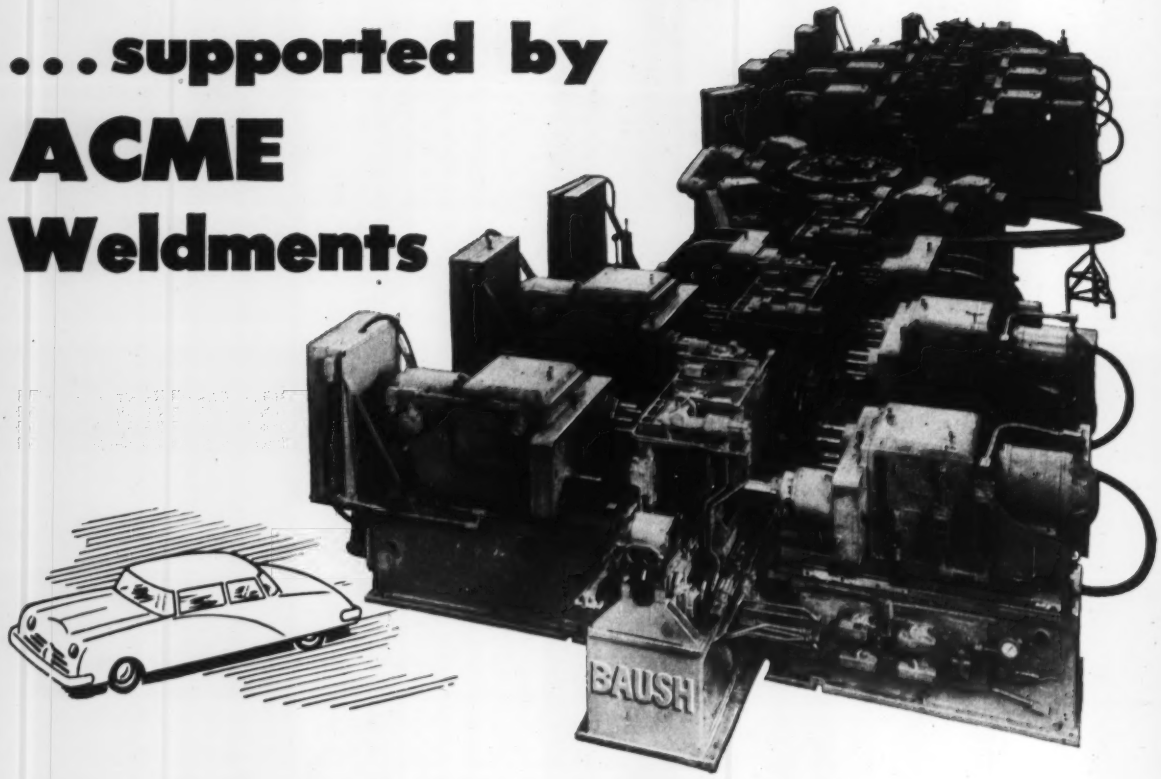
Distributors throughout the U.S.A.

1068

MACWHYTE COMPANY, 2912 Fourteenth Avenue, Kenosha, Wisconsin

AUTOMATION at work

...supported by ACME Weldments



18,240 operations — 80 automobile transmission cases every hour! That adds up to quite a day's work, but it's no problem for this transfer machine built by the Baush Machine Tool Company of Springfield, Massachusetts. Unusual sectional design permits rapid retooling, keeps work handling to a minimum, and speeds production in many of America's largest automotive plants.

To provide the *strength* and *rigidity* required by this complex, automatic machine, Baush engineers specified all-welded steel bases fabricated by *Acme Welding*. Beside being stronger these Acme weldments are lighter and make possible the incorporation of many exclusive design features. Perhaps these advantages of Acme weldments are important to your product . . . whatever your requirements, why not call on Acme *today*.

A.S.M.E. U68-U69 Qualified Welders • A.P.I.-A.S.M.E. Approved
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National Board Approved • Hartford Steam Boiler Inspection Service

Send us your blueprints for a prompt quotation and ask for our informative booklet, "The FACTS about WELDMENTS and CASTINGS."

Ask for Bulletin B-2.

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DIVISION of THE UNITED TOOL & DIE CO.

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National Representative TRANSMISSION EQUIPMENT CO., Inc.
441 LEXINGTON AVE., NEW YORK 17, N. Y.

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 10 September 6, 1954

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

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As the Editor Views the News 45

Big Labor: Growing Up 49
Less rowdyism, less running to the government indicate that labor is maturing, but reforms are still needed

NLRB Quietly Shifts Its Position 50
The U.S. agency is changing a vast body of decisions to conform better with the spirit of Taft-Hartley

Toledo, Louisville Calm Their Labor Storms 52
Both have successfully sponsored labor-management-public committees to stave off trouble

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You can do a better job of controlling incoming materials. Here are two systems that show how.

Cast-Weld Construction 96
Big, complicated castings need not be ruled out if plan is to weld smaller cast sections together.

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Combination of hand-operated jobs with in-line feed mechanism automated this job. Here's how it was done

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Editorial, Business Staffs—16. Advertising Index—157. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

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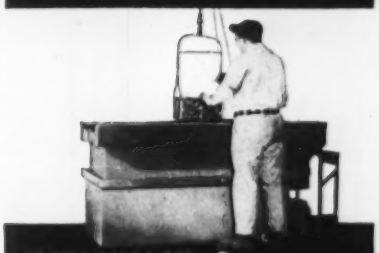
Do a Better Job Faster...

cut cleaning costs RIGHT DOWN THE LINE!



METALWASH Degreasers are *4-Ways* better

UNOBSTRUCTED TANK WALLS. The condensing coil and trough are recessed into a back compartment providing *superior vapor control, more efficient solvent reclamation,* and an *unobstructed working area.*

WATER SEPARATOR and PUMP CHAMBER, fabricated of stainless steel, are *unitized* for easy removal in minutes.

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All types of vapor degreasers, automatic or hand operated, are available in standard and special sizes.

WHAT YOU SHOULD KNOW ABOUT *Vapor Degreasing*

METALWASH has prepared an authoritative, illustrated booklet containing a description of the theory and operation of vapor degreasers plus diagrams and cutaway photographs of the three basic types of degreasers. **Write today for your Free copy.**

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Uniform
Class 3 Fit
**BOLTS
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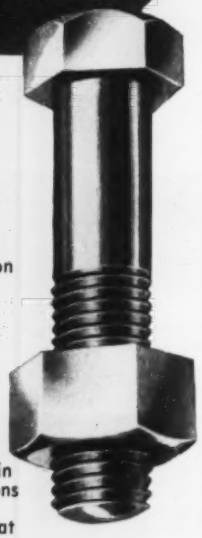
STUDS**



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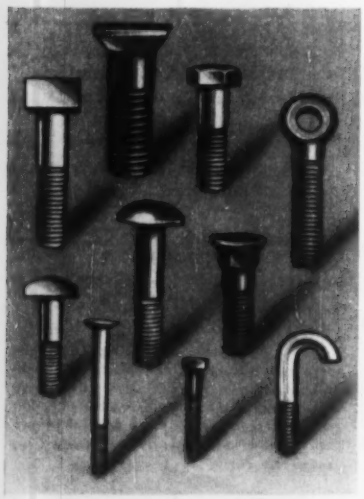
- **Alloy Steels**
- **Stainless Steels**
- **Silicon Bronze**
- **Naval Brass**
- **Monel Metal**

You can depend on a uniform Class 3 fit if required when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.



BETTER BOLTS SINCE 1882

PAWTUCKET
MANUFACTURING COMPANY
327 Pine St. • Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.
"The Bolt Man"

behind the scenes

Sweating Out a Cover

Business papers have traveled a long way from their humble beginnings. We would like to prod our recollection and institute a little research in the matter of surveying starters in the field of business expression, but that would lead us astray from our current subject, which is: the conception, travail and accouchement relating to a STEEL cover.

Business papers are stepping out in classy company these days. Their contents always were well conceived, but the artistic development of appearance noted in the slicks got a late start in what we used to term trade papers. Many modern business papers are a delight to the eye, even to a man who can read nothing but Gaelic; *Machine Design,* for example, a sister publication of STEEL, is one of the slicks of the business press. (And we might add, that unless you're an engineer, much of the copy in that distinguished magazine *looks* like Gaelic.)

In line with the thinking that independence and prestige are necessary qualities in a self-contained magazine, and that these qualities are readily reflected from its cover, officers of this company a few years ago decreed that STEEL's cover henceforth should be employed to draw attention to its contents.

That's easy enough. You pick out the important story and make a cover about it. So what's difficult about that? Brother, leave us take you by the hand and show you how far you can miss the base.

Operation Inspiration Begins

The drama begins with a telephone call to Art Director Bill Kellogg; he listens intently, hangs up and quickly summons several of his stalwarts. In a few moments Kellogg, followed by Ace Bouhall, Tiger Farnsworth and Hot Shot Bryan troop into Managing Editor Walt Campbell's office. The artists bear scratch pads with them; their eyes, ears and pencils are pointed toward Campbell's group, which may include half a dozen assorted associate editors.

Campbell briskly outlines the story, attentive editors qualify it, Kellogg and his assistants ask questions, and Ace Farnsworth might be observed making a sketch of a pussy cat. Shortly after, Kellogg swims to the top of a heap of rough sketches with the most promising design clutched in one hand, and assigns one of his men to whip it into shape. When the layout is finished, various editors examine it and make suggestions; Bouhall cuts out paper silhouettes and moves them briskly over the drawing; visiting space salesmen offer comments, and the author of the article, if he is present, hovers over the sketch exhibiting all the anxiety of a maternal elk nearing her time. Engravers are consulted, printing problems are discussed, and Kellogg glances at his watch: time, you see, is of the essence.

Everybody Enters The Act

When everybody including the office boy is satisfied and impressed, the finished art is prepared and delivered to the engraver. Later color proofs are returned, and the Art Director examines the impressions. He checks color, register, design, finish, and calls in the editors. One of them might suggest a change in the caption; another confesses that he is not partial to blue because it reminds him of his mother-in-law; the composing room foreman doesn't care what color it is—all he wants is the go-ahead signal. He receives it at last, principally because there's not enough time for extended debate, and he flees with his plates to the eager and panting presses.

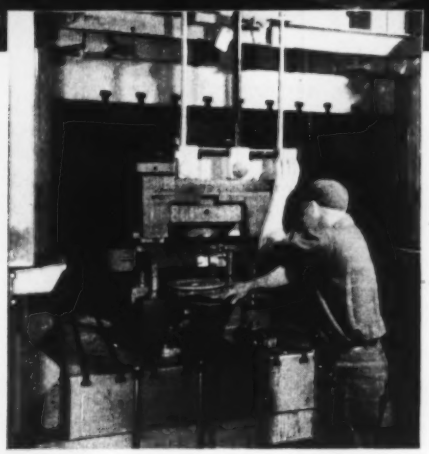
On the following Monday STEEL hits the desks of key personnel in the metalworking industry. Its clean, intelligent, well designed cover stares at the reader and tells him at a glance something pertinent and interesting. The subject introduced might concern news, markets or engineering, but no matter what it is you may rest assured that it is well brought out, well presented and well packaged. The cover, into which so much thought and energy have been directed, has steered another reader toward more helpful information.

Shrdlu

(Metalworking Outlook—Page 41)

Another job done better with a Verson press

THIS Verson 2500 TON FULL ECCENTRIC PRESS forms automotive flywheels



Close-up of the die space in this 2500 ton Verson Full Eccentric Press showing the part being formed.

If you want to combine the highest standards of accuracy and uniformity in stampings with long, dependable, trouble-free press life, a Verson Full Eccentric Press is the answer. Verson Full Eccentrics incorporate the sum of over thirty years' experience in the manufacture of rugged high strength presses designed to produce better stampings at lower cost.

Such features as the Verson Allsteel Frame . . . the Verson full eccentric drive . . . straight thrust eccentric strap . . . extra long, barrel type, non-oscillating vertical adjusting screw . . . anti-overlap clutch and brake unit put Verson Full Eccentrics in a quality class by themselves.

The press shown above is typical of Verson Full Eccentric Presses. It is being used to form heavy flywheels on a high production basis. Note the long, extra heavy special gibbing and rugged construction throughout—assurance of the accuracy and uniformity required in a part like this.

The Verson Full Eccentric line includes models with one, two and four point suspension in capacities from 100 tons up. Further data is given in Catalog G-52. Write for your copy.

A Verson Press for every job from 60 tons up.

Verson

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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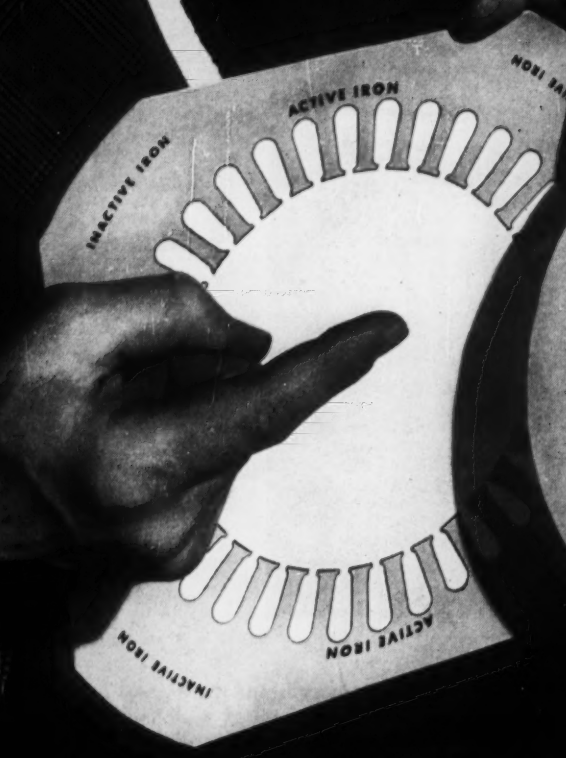
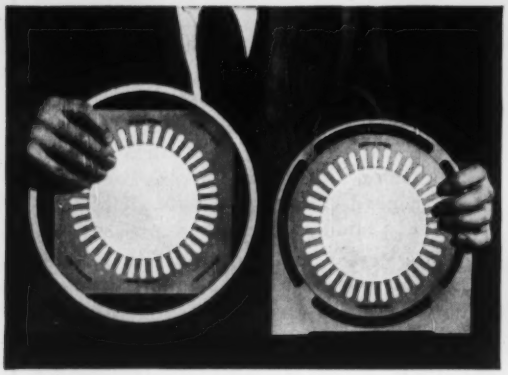
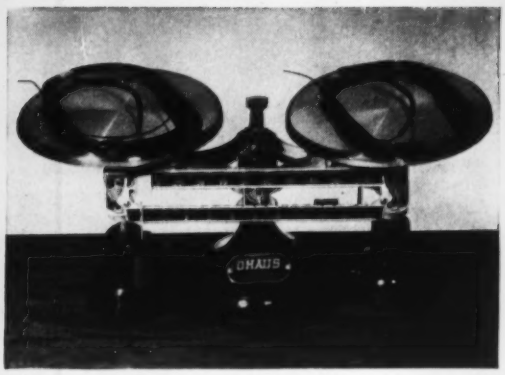
MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

Here are laminations from two 5-hp Life-Line motors. Note that only the inactive support corners of the original Life-Line square stator have been eliminated from the round stator of the Life-Line "A" motor.





When the stators are placed in their respective frames we see how the Life-Line "A" size reduction has been accomplished without sacrificing active magnetic steel. Excess air space has been eliminated also.



Copper, the other important active material, has not been sacrificed. The coil on the left is from an original Life-Line motor. The coil on the right is from a new Life-Line "A" motor. Both weigh the same.

Here's how more horsepower has been put in the Life-Line A motor

These demonstrations show how motor performance is determined by "active" material

Perhaps you are a motor user who has raised the question: "How can you shrink the size of a motor and still equal or better the original performance?" Let's look inside a motor to find the answer.

The performance of any motor is dependent upon its active material—the magnetic steel and copper. Take the original Life-Line® and the new Life-Line "A" for example. The amount of magnetic steel in the stator and rotor and the copper in the coils of both Life-Line designs are the same. The reduction in size has been accomplished by eliminating inactive material and space. Thus you have a smaller motor whose basic electrical performance remains unchanged. In fact, the Life-Line design principle has been proved in service for over seven years.

J-21848

For the complete story on the new Life-Line "A" motor write for your copy of Booklet B-6154. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

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LETTERS
TO THE EDITORS

Distribution's Traffic Cops

I would appreciate receiving a copy of your article, "Transportation in Distribution: Move Ahead with Better Traffic Management" (Aug. 23, p. 89), Number 6 in STEEL's 1954 Program for Management.

C. C. Ackerman
manager standards engineering
Roller-Smith Corp.
Bethlehem, Pa.

Would you please send me reprints of this and the other articles in STEEL's 1954 Program for Management.

S. F. Wasserman
director of purchases
Globe-Union Inc.
Milwaukee

I have just finished reading your article, "Transportation in Distribution" and I wish to compliment the writer for having produced it and STEEL for having carried it. It is well done and from my point of view most worthwhile.

Andrew H. Brown
president
National Industrial Traffic League
Cleveland

Men Who Know Job Rating Best

I would like more information on the National Metal Trades Association's job and employee rating plans as described in your article, "Eliminate Pay Inequities in Your Plant" (Aug. 23, p. 60).

Kim T. Speer
Engineering Department
R. J. Reynolds Tobacco Co.
Winston-Salem, N. C.

● *The best source of information is George Earl, commissioner, National Metal Trades Association, 122 So. Michigan Ave., Chicago 3.—ED.*

Building Air Force Bosses

For more than three years, this university has been conducting a program of advanced management training for senior officers of the U. S. Air Force. By next May, more than 2500 officers will have completed our program, ranging in grade from lieutenant colonel through major general. You appreciate what this means in terms of course level and impact on the national defense effort.

One of the techniques we have found extremely valuable with these officers is supplying them with material drawn from the best periodicals in the field

(Please turn to page 12)

SNYDER SPECIAL

17-STATION, AUTOMATIC LINE TRANSFER
WITH OVERHEAD INDEX
MILLS, DRILLS, CORE-DRILLS, SPOT-FACES
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AT 80% EFFICIENCY

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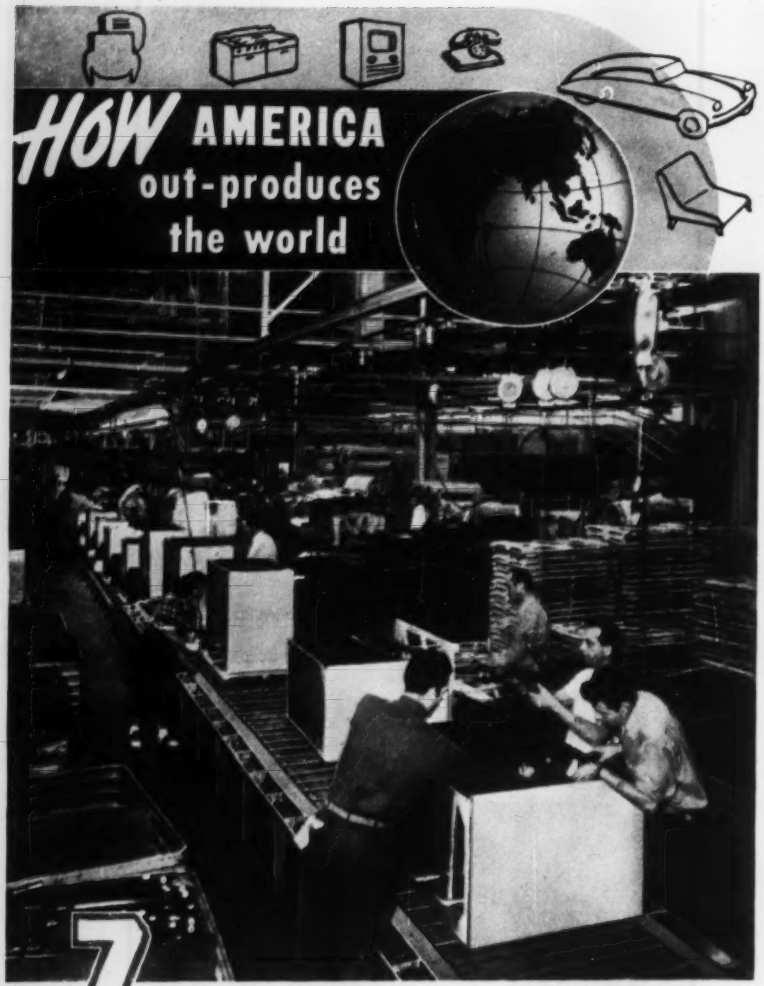


1000 electric ranges are assembled per 8-hour day on this Logan Apron Conveyor in the plant of a nationally-known manufacturer. Level of conveyor varies to make the most convenient working height for operators at different stations.

American Industry — "Sets a fair and productive pace for operations"

Pace-making standards are as essential to industry as the air we breathe. The American manufacturer knows this intuitively Probably no one factor in his busy routine receives more attention than fair pace-making. The result is maximum output, and employee satisfaction at the same time.

Remember, equipment like Logan Conveyors comes nearer to establishing a fair "pace that pays" than any other equipment in today's industrial plant.

And by the way, be sure to specify "Logan" Conveyors when you buy. Logan engineering, workmanship, and service cost no more. Write today to

Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

LETTERS

(Concluded from page 10)

of management. We have found such material much more acceptable to these senior people than even the best text books.

We would be very grateful for your permission to reproduce the article, "Build Better Bosses" Number Two in STEEL's 1954 Program for Management (Mar. 22, p. 81).

Augustus C. Johnson
assistant co-ordinator
George Washington University
Washington 6

• *Of course, permission granted.—ED.*

Magic of Cost Cutting

I have just finished reading with great interest your article, "How To Reduce Selling Costs Without Scuttling Your Sales Program" (Aug. 16, p. 65). I would like to get a tear sheet of it.

C. W. Hunter
H. A. Wilson Co.
Union, N. J.

Steelmaking in Buffalo

The Buffalo Chamber of Commerce is currently doing some research on the steel industry in Buffalo. We would like very much to have the following information:

1. What geographic area does the Buffalo area include as reported for various districts throughout the U. S. in STEEL each week?
2. What companies and plants are included in the district?
3. What is the steel ingot capacity of the district?
4. How many open hearths are included for the district?

John J. Howard
Research & Statistics Department
Buffalo Chamber of Commerce
Buffalo

• *The steel ingot capacity of plants in the Buffalo district as of Jan. 1, 1954 was 6,452,100 net tons annually. The geographical limits of the Buffalo district are indicated by the locations of the plants in the district: Republic Steel Corp., 9 open hearths in Buffalo, annual capacity—882,000 net tons; Bethlehem Steel Co., 34 open hearths in Lackawanna, N. Y., capacity—5 million net tons; Colorado Fuel & Iron Corp., 4 open hearths in Tonawanda, N. Y., capacity—252,000 net tons; Simonds Saw & Steel Co., 3 electrics in Lockport, N. Y., capacity—21,600 net tons; Erie Forge & Steel Corp., 5 open hearths in Erie, Pa., capacity—234,000 net tons; National Forge & Ordnance Co., 3 electrics in Irvine, Pa., capacity—25,000 net tons; Allegheny Ludlum Steel Corp., 3 electrics in Dunkirk, N. Y., capacity—33,000 net tons and 2 electrics in Tonawanda, N. Y., capacity—4500 net tons.—ED.*

Better Brazing

that actually costs less!

Saves $25,000 ANNUALLY!

SAE-1010 steel bicycle forks are brass brazed at the rate of 280 forks per hour in a mechanized Ajax salt bath unit that brazes, washes and dries the forks automatically. Production has been increased 270%.

THE BRAZING IS PRACTICALLY Free!

Brazing and carburizing of this SAE-1010 steel sprocket assembly are completed simultaneously with one heating of the work in an Ajax salt bath carburizing furnace. Hub is brass-brazed to sprocket body . . . The assembly is file hard after oil quenching.

Tolerances OF 0.002" EASILY HELD!

Micro-wave components, like this aluminum wave guide, can be aluminum dip-brazed, holding tolerances of 0.002". Fast brazing time and uniform bath temperatures (guaranteed within 5°F of control point) give high production and uniform results.

LABOR Costs Cut 96%!

Copper heat exchangers are silver brazed in only 1¼ minutes in a 1500°F bath. Return bends on each end are brazed simply by immersing only that portion of the assembly. Former hand torch brazing required 30 minutes.

Any material that can be brazed at all can be brazed in an Ajax Electric Salt Bath Furnace — *much faster, better and usually at lower cost.* First cost of equipment is only ½ to ⅓ that of any other production brazing system. But that's only part of the story:

Brass Brazing of Steel Parts — Brass brazed joints are fully as strong as those of copper! This money-saving method is possible *only* with a salt bath furnace, thanks to its greater heating speed — so fast that no dezincification of the brazing metal occurs. Brass brazing at 1700°F compares with 2050°F for copper. The lower temperature greatly reduces grain growth and distortion of the steel. Operating costs are less.

Brazing of Other Metals — Brazing aluminum, brass, copper and bronze assemblies is quick and inexpensive because of the Ajax furnace's rapid heating rate — 4 to 6 times faster than atmosphere type furnaces. Any suitable brazing metal can be used. Temperatures controlled within 5°F minimize distortion. Selective heating is easy. Scaling and decarburization are avoided.

Simultaneous operations possible — Where a brass brazed assembly must also be carburized or hardened, the entire job can be done in a single heating operation at 1700°F. The brazing is practically free!

Write for ... Bulletin 124, also list of documented brazing case histories covering a wide variety of industries.

Send ... Your sample parts to the Ajax Metallurgical Service Laboratory for processing. No cost or obligation.

AJAX electric SALT BATH furnaces

HUGHES-GREN

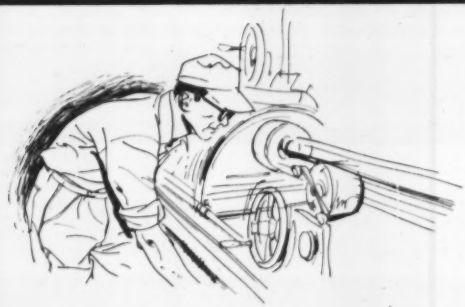
World's largest manufacturer of electric heat-treating furnaces exclusively

AJAX ELECTRIC COMPANY, 952 Frankford Ave., Philadelphia 23, Pa.

Associated Companies: Ajax Electric Furnace Corp. • Ajax Electrothermic Corp. • Ajax Engineering Corp.

FACTS ABOUT **VACUUM-MELTED** METALS AND ALLOYS

Machine Bearing Rejects WERE 42% ...NOW only 5%



A machine tool manufacturer had 42% rejection of bearing races at final inspection, after two regrinding operations. Substitution of vacuum-melted steel reduced this loss to less than 5%. Properties of vacuum-melted metals include: greater impact and fatigue strength . . . better machinability . . . cleaner, higher polished surfaces. We can deliver commercial quantities. Write for more facts.

These Vacuum-Melted Metals Now Available

FERROVAC® 52100 and 51100
FERROVAC® 4340
HIGH ALLOY STEELS

VMC **VACUUM METALS CORPORATION**

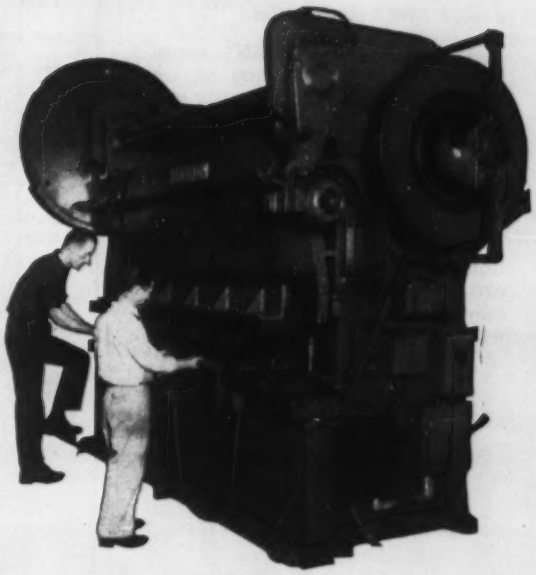
P. O. BOX 977, SYRACUSE 1, NEW YORK

Jointly owned by Crucible Steel Company of America and National Research Corp.

Photos courtesy Kirk & Blum, Cincinnati, Ohio

72 HOLES

where they belong



Economical assembly depended on maintaining the accurate spacing of these 72 holes and their accurate positioning on this 10-gauge sheet.

This Cincinnati Press Brake is giving a high production at low cost by its speed and accuracy of performance, which insures rapid low cost assembly.

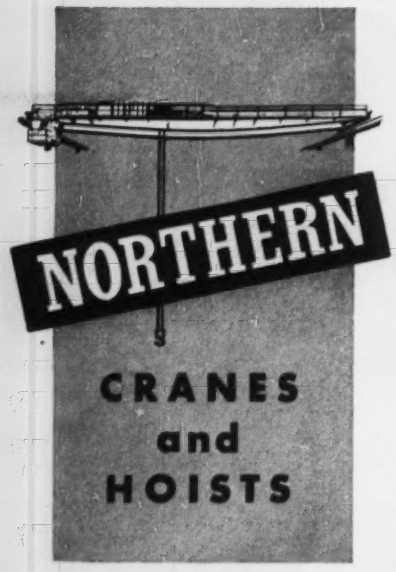
As a press, they offer high production with low investment. As a Press Brake, their low set-up costs, quick change-overs and versatility bring profits.

Write for Catalog B-4 where many examples of the versatility of Cincinnati Press Brakes are illustrated.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



Look Overhead . . .
See **"NORTHERN"**

"NORTHERN" — the name you see on overhead electric cranes in industrial plants of all kinds wherever you may be, because NORTHERN — since 1899 — has been a leader in industrial crane design and construction.

The name "NORTHERN" represents faithful adherence to uncompromising design, quality controlled machining, and closely inspected fabrication. "NORTHERN" Cranes and Hoists have an extra margin of safety — give dependable, fast service under the most rugged, emergency conditions — are notable for fine, standard-type electrical equipment and controls for precise manipulation and quick, easy maintenance with minimum downtime.

Let us send you Crane Bulletin SE-108-A
Hoist Bulletin H-112

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ENGINEERING WORKS
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THE WEEKLY MAGAZINE OF METALWORKING

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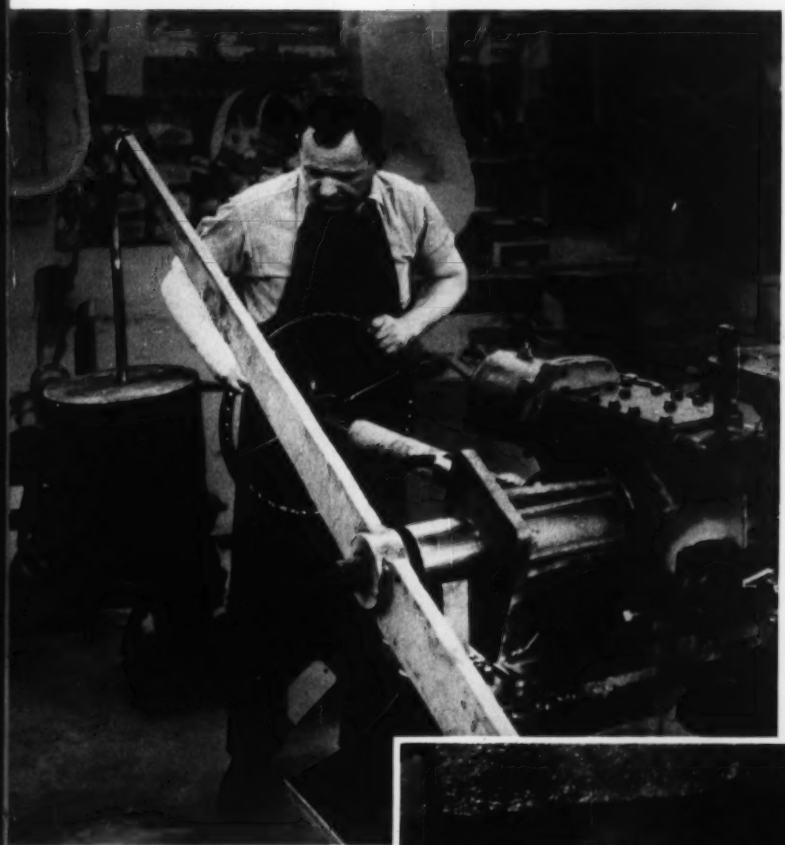
NBP

New facts for your file on

USS CARILLOY STEELS

USS Carilloy steels minimize distortion in power steering units for cars



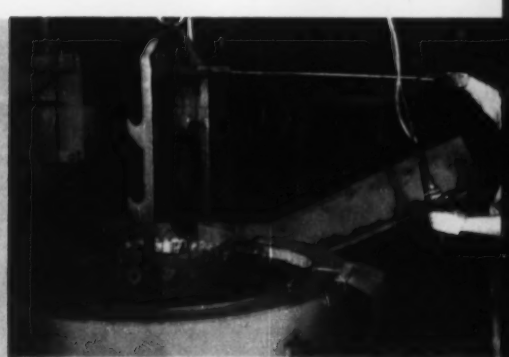
Torque Testing of completed steering unit. Even the heaviest steering loads require only 3 lbs. pull by the driver of an automobile with power steering. In addition, road shocks are cushioned by the power steering unit.

POWER steering units are precision machines. Every part must fit exactly. Parts must be interchangeable. They must be made to finished tolerances as small as .0001". They must be heat treated with minimum distortion.

These rigid requirements dictate the use of accurately controlled *alloy* steels that can be *quenched in oil*. These steels must respond uniformly to heat treatment, time after time, so that many thousands of parts can be made —*all exactly alike*. USS CARILLOY steels are used extensively in power steering units because they help to insure the uniformity that is essential in all critical parts.

CARILLOY steels are giving excellent service daily in a wide variety of precision parts for automobiles, aircraft, trucks, farm equipment, construction machinery, rotating machines, and many other applications. These high quality steels are meeting some of the toughest requirements known to industry. They can meet yours. For information write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Worm Shafts are ground to within .0005". Alloy steel must be used for these parts so they can be quenched in oil with a minimum of distortion to maintain the close tolerances.



Heat Treatment. USS CARILLOY steels have the uniformity in response to heat treatment that is so necessary to obtain the high strength, adequate ductility and minimum of distortion required in power steering units.

USS

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

"We really had to put

says Frank Andras,

THAT piece of red-hot steel in the press jaws will soon be doing one of the toughest jobs known. It will crush taconite, just about the hardest of ores. This rugged service requires the combination of a special nickel-bearing alloy steel, and high reduction to secure a sound forging. In the words of Frank Andras (a U. S. Steel Pressman for 17 years), "We had to squeeze her down until the cross-sectional area was ⅓ of the original ingot."

This forging will serve as the shaft in a gyratory crusher. It will be used in a taconite reduction plant in northern Minnesota where temperatures drop to 30° and 40° below zero, a bitter cold that causes brittle failure in ordinary steels. The shaft operates like the pestle in a druggist's mortar and pestle. It wobbles and rolls, splitting the stubborn, rock-like taconite into smaller pieces.

It requires the finest steel and equipment to produce USS Quality Forgings that can withstand this kind of brutal service. Equally important are the men who actually work on each forging. Frank Andras, for example, has been a U. S. Steel employee for 33 years. His father was a forging machinist in the same shop for 50 years. His brother has been a Heater for 16 years. These are typical of the men who work on your USS Quality Forgings.

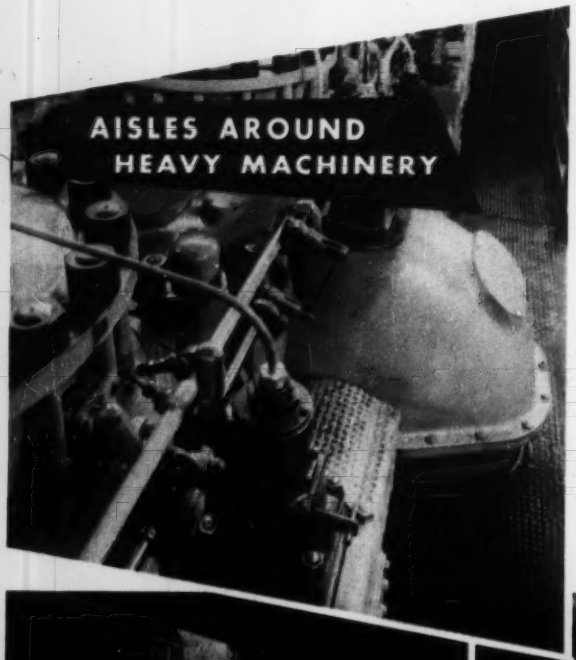
Write for our free 32-page booklet that describes USS Quality Forgings. United States Steel, Room 4463, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS *Quality*

the squeeze on this forging"

U. S. STEEL PRESSMAN

Have you *safe-treaded* all the danger spots in your plant . . . with Multigrip?



● USS Multigrip Floor Plate was scientifically designed to prevent accidents resulting from slips and skids. It'll pay you to look around *your* plant or shop for possible accident-prone areas that could be made safe with Multigrip. For it provides positive traction for feet and wheels at all times, from any direction.

Multigrip is comfortable to walk on, less tiring to work on because its "grip" risers are flat-topped.

Not only does Multigrip protect workers, but it protects floor surfaces too. It is rugged, heavy duty steel plate that will last for years without requiring any maintenance. (Multigrip does not chip, crack, rot or splinter as other flooring materials do.) And it's easy to keep clean . . . a quick "once over" with the hose or broom will get it spick and span. There are no niches to hold dirt; water drains quickly in any direction.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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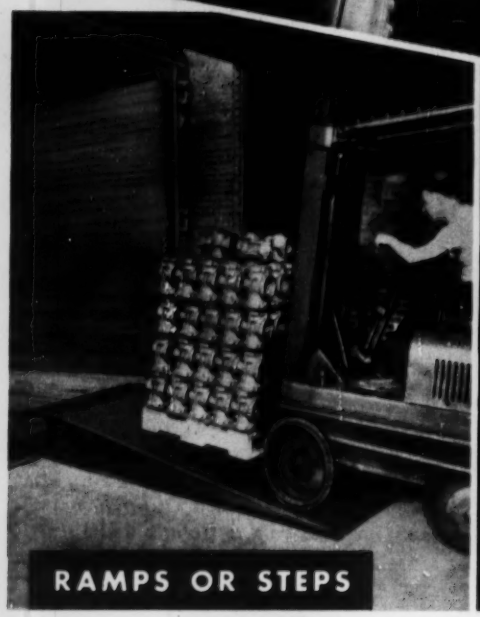
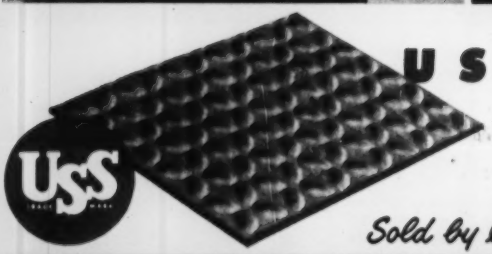




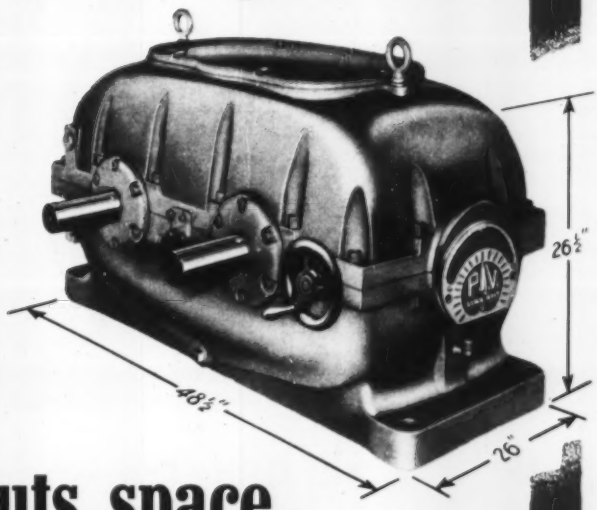
USS **multigrip**

FLOOR PLATE

Sold by leading distributors from coast to coast

UNITED STATES STEEL

LINK-BELT 25-hp P.I.V. Variable Speed Drive



cuts space requirements up to 50%

LINK-BELT gives you all the advantages of positive, stepless speed changing in high horsepowers, too

ONE of the great advantages of P.I.V.'s positive, all-metal drive is dramatically illustrated by the Size 6. Compared to other speed changers in this hp range, it saves *70 cu. ft. of space!*

In addition, infinitely stepless regulation means you can select the exact speed you want—from maximum to minimum. Unaffected by temperature and atmospheric conditions, all moving parts are totally enclosed and splash-lubricated.

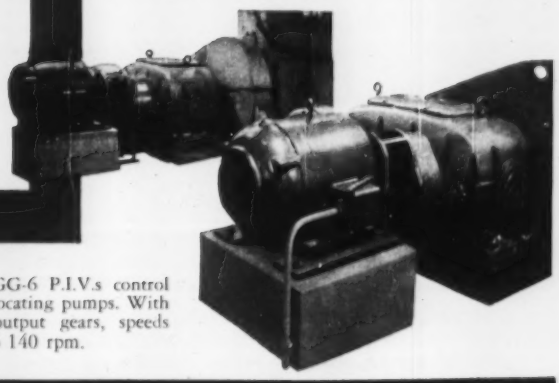
The Size 6 P.I.V. is built in three types: The basic drive . . . with input *or* output gears . . . with input *and* output gears. All are available in a wide range of ratios, 20 to 25 hp.

Get the facts on the Size 6 from your nearest Link-Belt office or distributor. You'll receive a copy of Folder 2374. And for information on the complete P.I.V. line, ask for Book 2274.

P.I.V. LINK-BELT P.I.V. VARIABLE SPEED DRIVE

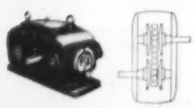
13.594

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

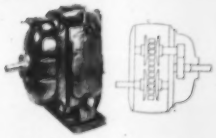


Two Link-Belt HGG-6 P.I.V.s control the speed of reciprocating pumps. With both input and output gears, speeds range from 46.5 to 140 rpm.

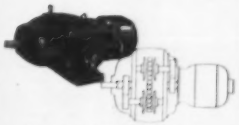
4 OF 16 P.I.V. TYPES
HORIZONTAL OR VERTICAL MOUNTINGS
¼ TO 25 HP—
RATIOS TO 6:1



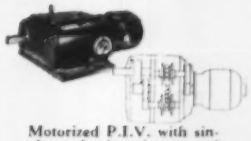
Basic, Positive, Infinitely Variable (P.I.V.) Speed Drive.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.

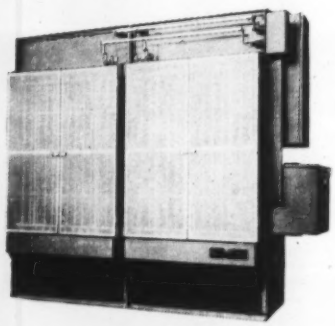
CLEAN AIR

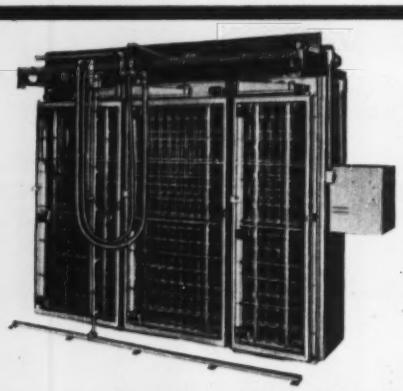
FOR MOTOR ROOM VENTILATION

Dust, dirt and smoke are the sworn enemies of mill motors and switching gear. That's why clean air for motor room ventilation is so vital to continuous operation and low maintenance costs. For such applications, where only super-clean air will suffice, AAF offers a choice of two high efficiency electronic precipitators.

AAF Electro-Matic

A self-cleaning electronic precipitator which automatically eliminates the messy job of washing and re-oiling collector plates and disposing of the precipitated material. Even more important, this exclusive self-cleaning feature minimizes the personal element as a factor of performance and permits continuous operation at maximum efficiency. Ask for Bulletin No. 250.





AAF Electro-Cell with Type H Washer

A stationary, plate-type electronic precipitator which, with the addition of the Type H Washer, provides push-button control of complete cleaning operation. Both washing and re-oiling of collector plates are fully automatic after starting button is pushed. If manual cleaning is preferred, collector plates may be washed and re-oiled in place or easily removed for inspection. Ask for Bulletin No. 252.

AND BLAST FURNACE OPERATION

The pressure blowers on which blast furnaces depend for their air supply have a spot that is vulnerable to dust and dirt. It's the impeller blades. If the intake air is not thoroughly cleaned of these particles, they act as an abrasive on the blades, causing rapid wear and eventual shutdown for repairs. One air filter—the AAF Multi-Duty—has proved an outstanding success in this service and scores of these units are today serving the steel industry throughout the world.

AAF Multi-Duty

An automatic, self-cleaning filter designed for handling heavy dust loads. Continuous, automatic cleaning of the filter curtain assures both constant efficiency and uniform air delivery regardless of the dust load. Its operating resistance remains fixed, when once established for a given dust concentration and requires no attention other than periodic inspection and removal of sludge at regular intervals. Ask for Bulletin No. 241.

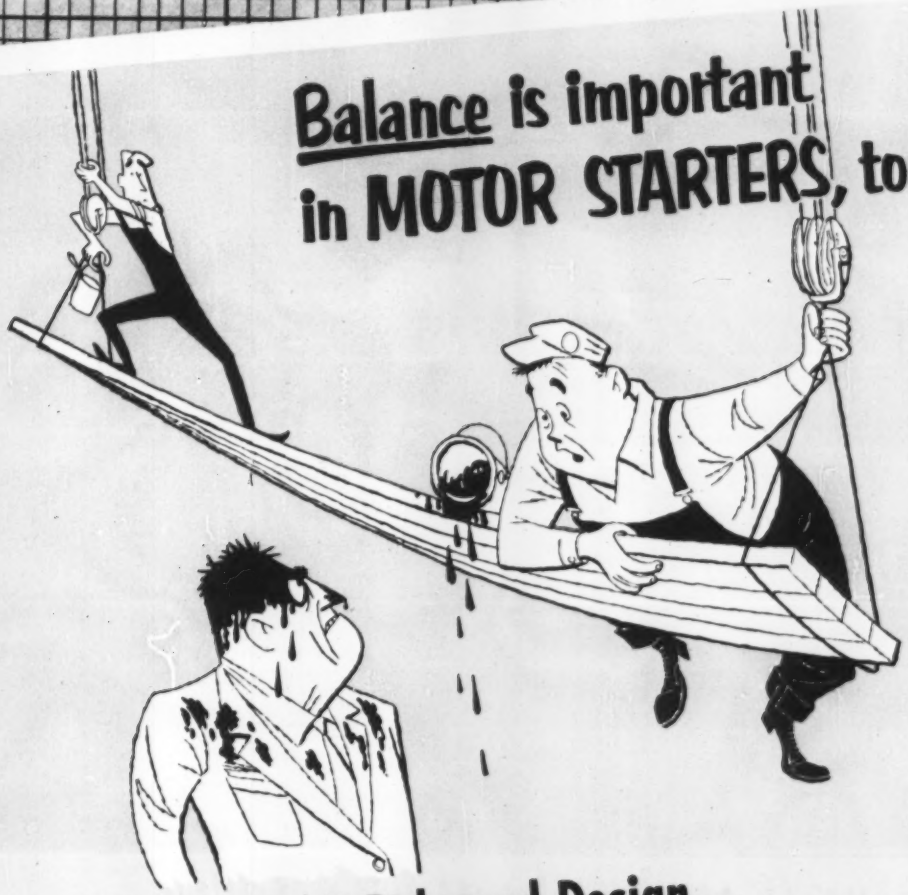
AAF

American Air Filter

COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 443 Central Avenue, Louisville 8, Kentucky

Balance is important in MOTOR STARTERS, too!



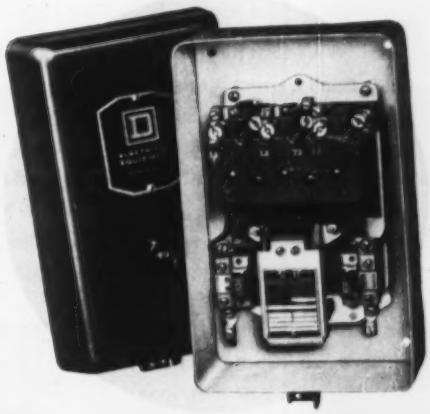
Only Square D Balanced Design Gives ALL the Features without sacrificing Any One!

EASY INSTALLATION. Plenty of wiring space with *no sacrifice of compactness.*

SIMPLE MAINTENANCE. Coils, contacts, interlocks, overload relays easily changed without disturbing external connections. Normal maintenance made still easier with standardized parts kits. No complicated identification, ordering or stocking.

FLEXIBILITY. A wide range of special requirements can be met in the field, using standard starters and parts kits available from local distributor stock.

THEY COST NO MORE . . . WHY SETTLE FOR LESS?



ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

"It's lucky we met today!"

"Good morning, Tom. How's the new house coming along?"

"Fine! We're getting pretty well settled. One thing that I didn't expect is that I'd like this idea of commuting rather than driving. Sure does save time. Say! It's lucky we met today, Bill. I received one of your Wolverine direct mail pieces yesterday. That part about fabrication interested me. We're having trouble with an aluminum part down at the plant—can't keep costs in line. Do you think you can help us?"

"Fabrication is one of the things we specialize in, Tom. I'm sure we can help. That part you're making sounds like the one you mentioned the other day. Tubular, isn't it?"

"That's right."

"Well, then, that's a natural for our Wolverine Spun End Process*. We start off with a plain length of tube and—by spinning and using the proper die—we reduce it, neck it, fully or partially close it. We eliminate extra parts—the possibility of a seam or joint—and deep drawing. Our Spun End Process is fast, dead accurate, slashes costs to the bone and does a terrific job. We can handle tubes up to 3" O.D."

"You've taken a load off my mind, Bill. This job pretty near had us licked, but I'm convinced you have the answer."

"Providing answers to tubing problems is our business, Tom. Here comes our train. Let's grab a seat and I'll give you the rest of our fabrication story!"

BILL IS RIGHT. Providing the RIGHT answer to tubing problems IS our business. That's Tubemanship and why Wolverine's facilities are so complete. If you use tubing of aluminum, copper, or electric-welded steel, you'll do best to come to Wolverine. For the complete story, write for Wolverine's handy Statement of Scope.

*A PATENTED PROCESS RE. 22465

**REG. U.S. PAT. OFF.

"What's it all about?"

"This is the part I like best about commuting—no traffic to buck! But—look—get on with your story. This piece I got in the mail tells about different fabricating processes than spinning. It mentions steel tube, too. What's it all about?"

"Well, Tom, I'll start with our electric-welded steel. It's a product that's so good we call it Qualitube.** That means it's the best that Wolverine Tubemanship can produce.

"Qualitube comes in three types—condenser, boiler and mechanical. It has many advantages. For example, in heat application it can be used at much higher temperatures than non-ferrous tubing. It is also readily fabricated. Besides spinning, we're equipped to do special bending, coiling, flaring, expanding, swaging, beading, piercing and drilling, soldering, brazing and threading. In fact whatever your "specs" call for, we can give you."

"Bill, I had no idea Wolverine covered such a wide field. I do know that you have a special finning method. Can your steel tube be finned, too?"

"It sure can. We call our finned tube Wolverine Trufin.* Its fins are integral—squeezed right from the tube wall. That's important because it means those fins are permanent for the life of the tube. Trufin also comes in three metals and in a special form known as bi-metal. This allows us to supply finned tube that will stand up under a wide range of corrosive situations."

"We sure would have saved a lot of headaches if we had gone to you people in the first place. We consider that we're specialists in our field and when it comes to tubing, there's no doubt about it—Wolverine has specialists, too."

IT MAKES SENSE! All of Wolverine's Tubemanship experience is ready to help you at any time. For a wealth of information about tube fabrication, write for your copy of the Fabricated Parts Book. WOLVERINE TUBE, Division of Calumet & Hecla, Inc., 1475 Central Avenue, Detroit 9, Michigan.

Wolverine Trufin is available in Canada through the Unifin Tube Company, London, Ontario

WOLVERINE TUBE
DIVISION OF CALUMET & HECLA, INC.
Manufacturers of Quality-Controlled Tubing

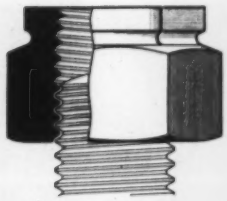
PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES.
EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, N. Y.

Manufacturers of couplings like these find that FLEXLOC Self-Locking Nuts provide faster assembly and safer, more dependable locking than is afforded by most other methods.

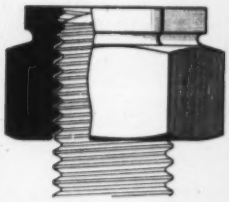
Here's why more and more original equipment manufacturers specify FLEXLOCs

Whether it's on power transmission couplings or on access doors of helicopters, more and more FLEXLOC Self-Locking Nuts are being used to insure positive fastening of assemblies.

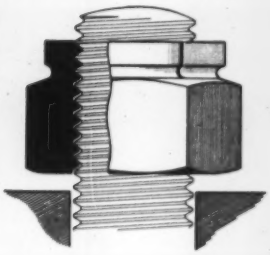
There are many reasons for this. FLEXLOCs reduce production costs. They are easy to install. They are one piece, all metal—nothing to assemble, come apart, lose or forget. They eliminate complicated, time-consuming methods of locking bolts and studs. They stay put—once their locking threads are fully engaged, they won't work loose. They are easy to get—SPS can make prompt delivery of FLEXLOCs in any quantity, and in a wide range of sizes, through a national organization of industrial distributors. Write for literature and samples. STANDARD PRESSED STEEL Co., Jenkintown 33, Pa.



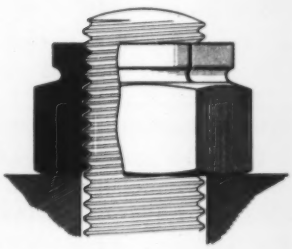
Starting. A FLEXLOC starts like any ordinary nut. Put it on with your fingers. Tighten it with a standard hand or speed wrench.



Beginning to Lock. As the bolt enters the segmented locking section, the section is expanded, and the nut starts to lock.



Fully Locked As a Stop Nut. When 1½ threads of a standard bolt are past the top of the nut, the FLEXLOC is fully locked. A FLEXLOC does not have to seat to lock.



Fully Locked As a Seated Nut. When it is used as a lock or stop nut, the locking threads of the FLEXLOC press inward against the bolt, lifting the nut upward and causing the remaining threads to bear against the lower surface of the bolt threads. Vibration will not loosen a FLEXLOC, yet there is no galling of threads.

FLEXLOC® LOCKNUT DIVISION

SPS
JENKINTOWN PENNSYLVANIA

CALENDAR
OF MEETINGS

September 7-9, Industrial Truck Association: Fall meeting, Greenbrier hotel, White Sulphur Springs, W. Va. Association address: Washington Loan & Trust Bldg., Washington 4. Secretary: William Van C. Brandt.

September 7-9, National Fluid Power Association: Fall meeting, Hotel Commodore, New York. Association address: 1618 Orrington Ave., Evanston, Ill. Secretary: Barrett Rogers.

September 8-10, American Society of Mechanical Engineers: Fall meeting, Schroeder hotel, Milwaukee, Wis. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

September 8-10, Porcelain Enamel Institute Inc.: Shop practice forum meeting, Urbana-Lincoln hotel, Urbana, Ill. Institute address: 1346 Connecticut Ave. N.W., Washington 6. Secretary: John C. Oliver.

September 8-10, National Bureau of Standards: Conference on cryogenic engineering, NBS-AEC cryogenic engineering laboratory, Boulder, Colo. Information: M. M. Reynolds, chairman of the conference, NBS Boulder Laboratories, Boulder, Colo.

September 10-11, Metal Powder Association: Fall closed meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

September 12-15, National Metal Trades Association: Eastern plant management conference, Sagamore hotel, Lake George, N. Y. Association address: 122 S. Michigan Ave., Chicago 3. Secretary: Charles L. Blatchford.

September 12-17, American Chemical Society: Fall meeting, Statler hotel, New York. Society address: 1155—16th St. N. W., Washington 6. Executive secretary: Alden H. Emery.

September 13-14, American Coke & Coal Chemicals Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 711—14th St. N.W., Washington 5. President: Samuel Weiss.

September 13-15, Allied Railway Supply Association: Annual meeting and exhibit, Hotel Sherman, Chicago. Association address: 1200 W. Chase Ave., Chicago 26. Secretary: C. F. Weil.

September 13-16, Society of Automotive Engineers Inc.: National tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 13-24, Instrument Society of America: First international instrument congress and exposition: Commercial Museum and Auditorium, Philadelphia. Information: First International Instrument Congress and Exposition, 921 Ridge Ave., Pittsburgh 12. Managing Director: Richard Rimbach.

September 16-17, American Hot Dip Galvanizers Association Inc.: Semi-annual meeting, Hotel Dennis, Atlantic City, N. J. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary-treasurer: Stuart J. Swensson.

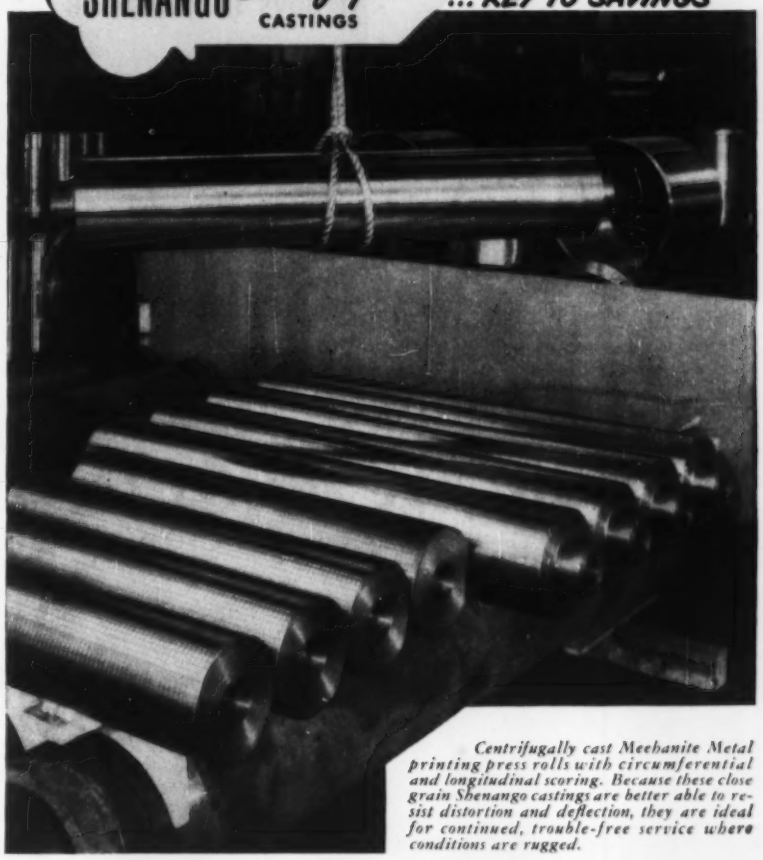
September 16-20, National Association of Waste Material Dealers Inc.: Fall meeting for metal and rubber groups, the Sagamore, Bolton Landing, N. Y. Association address: 271 Madison Ave., New York 16. Secretary: Clinton M. White.

September 20-22, Truck Body and Equipment Association Inc.: Annual meeting and exposition, Hotel Statler, Buffalo. Association address: 1616 K St. N.W., Washington 6. Executive manager: Arthur H. Nuesse.

September 20-24, American Mining Congress: Mining convention and exposition, Civic Auditorium, San Francisco. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

September 21-23, Society for Experimental Stress Analysis: Annual meeting and exhibit, Bellevue-Stratford hotel, Philadelphia. Society address: P.O. Box 168, Central Square Station, Cambridge 39, Mass. Secretary-treasurer: W. M. Murray.

SHENANGO Centrifugal CASTINGS ... KEY TO SAVINGS



Centrifugally cast Meehanite Metal printing press rolls with circumferential and longitudinal scoring. Because these close grain Shenango castings are better able to resist distortion and deflection, they are ideal for continued, trouble-free service where conditions are rugged.

Why Shenango Meehanite castings do a better job, longer

TAKE these printing press rolls, for example. They're not only made of uniform, precisely controlled Meehanite Metal, but they're produced by Shenango's centrifugal casting process.

This combination means stronger, *pressure-dense* metal, with more evenly dispersed graphite flakes, as well as freedom from porosity, sand inclusions, blowholes and other strength destroying defects.

If you need symmetrical or annular parts for tough service, large parts or small, finished or semi-machined, you will be time and money ahead with Shenango. You are welcome to the facts. Write to:

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO

COPPER, TIN, LEAD, ZINC BRONZES · MONEL METAL
ALUMINUM AND MANGANESE BRONZES · NI-RESIST · MEEHANITE METAL

It pays to know the difference

The hex socket identifies all socket screws, but beyond the hex there's a big difference. If you think all makes are alike — if you have never tried P-K Socket Screws — you are blocking your way to *proved* benefits that other buyers are using to advantage.

Look *beyond* the hex. For example, until you see P-K product information for the first time, you'll have no idea how much more helpful it is . . . how much time it saves . . . how much easier it makes the job.

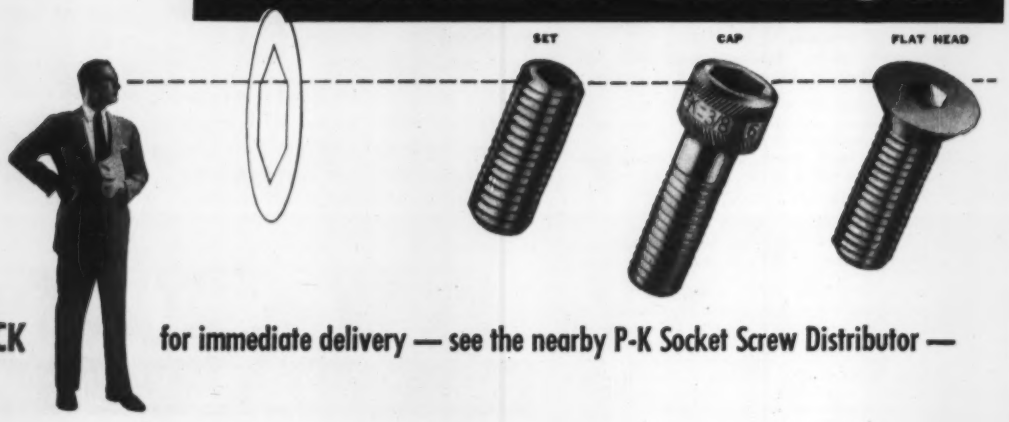
Look Beyond the Hex

Compare every detail of product and service. You'll find P-K Socket Screws take top rating by every test.

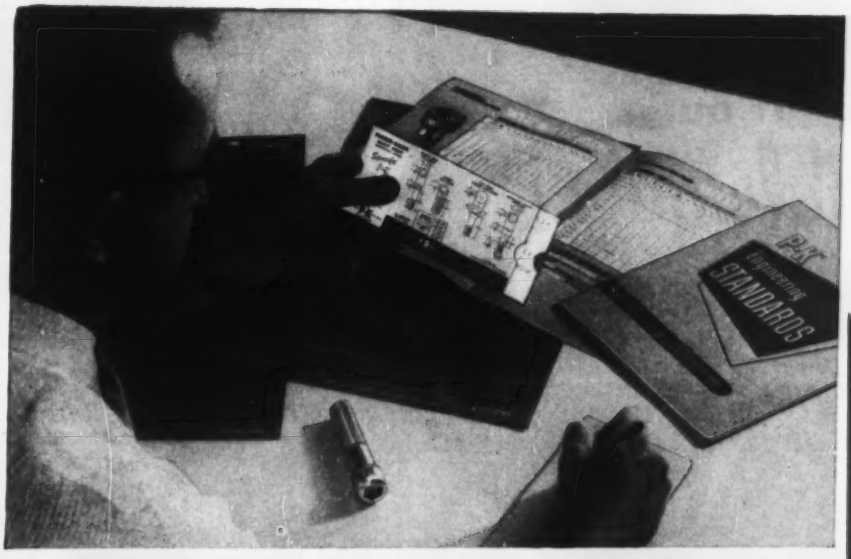
For cost-wise assembly, you need all these advantages. Why miss out on any of them? Try P-K Socket Screws. Get samples, information from your P-K Distributor or write. Parker-Kalon Division, General American Transportation Corporation, 200 Varick Street, New York 14.

for Planning Aids patterned to your special needs

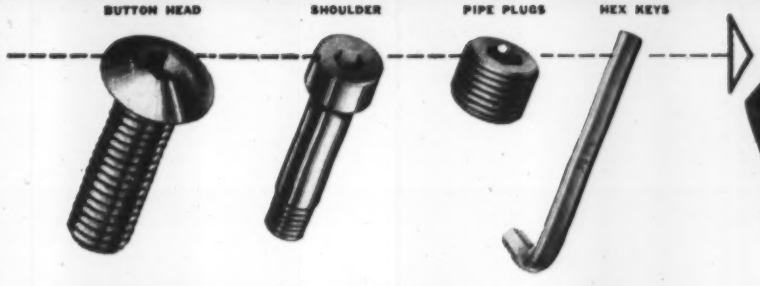
PARKER-KALON®



IN STOCK for immediate delivery — see the nearby P-K Socket Screw Distributor —



SOCKET SCREWS



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is prepared to meet the special needs of design, project, and methods engineers, to give anyone concerned with planning assemblies complete, clear, concise information. The popular P-K Socket Screw Dimension Finder is a pocket size plastic slide chart that gives all needed dimensions at a glance.

P-K PRICE DATA

wins praise from purchasers because it is easier to use, speeds ordering, prevents errors.

FOR ADVANCED DESIGN that speeds assemblies — makes them simpler, stronger — and saves errors.

FOR TOP QUALITY and tolerance gaged to your most exacting specifications — and guaranteed.

FOR ASSEMBLY STRENGTH okayed in a million punishing tests by thousands of satisfied users.

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FOR ANY STYLE OR SIZE You'll find any Socket Screw you need in P-K's complete line. Hex Keys in all sizes, and several handy sets.

GET **ALL**
THESE ESSENTIALS OF
COST-WISE ASSEMBLY
GET **P-K**

. . . SO THEY BOUGHT OUR double duty!

LEWIS

THE LEWIS WELDING & ENGINEERING CORP.

• Engineers • Designers • Fabricators • Machinists •

BEDFORD OHIO

Mr. H. J. Sandlotio
Chief Engineer
The Lewicicc Manufacturing Co.
Cincinnati, Ohio

Dear Mr. Sandlotio:

In answer to your inquiry of the 12th, we have integrated facilities for engineering and fabricating complete assemblies, component parts or heavy weldments to your specifications.

With fully equipped plants in Bedford and Euclid, Ohio, our company has the largest independent machine shop and custom welding facilities in the Cleveland area. We do not offer a pure design-engineering service, but are prepared to work with you in the final refinement and production of your products. Experience gained in developing and producing several proprietary products . . . as well as those of our customers . . . has given us a broad, flexible range of capabilities.

I will be in Cincinnati next week and look forward to seeing you. In the meantime, if you will send blueprints of the products you mentioned, I will have our engineering and production people prepare estimates of cost and delivery.

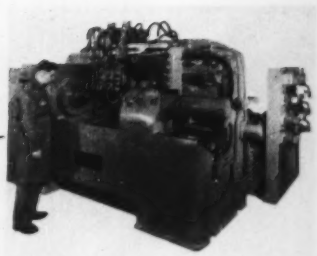
Many thanks for your interest.

Cordially yours,
THE LEWIS WELDING
& ENGINEERING CORP.

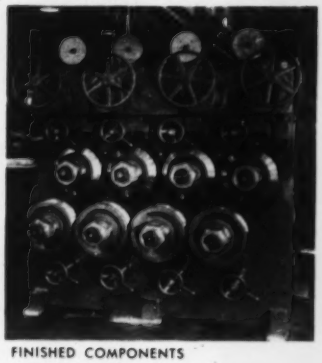
James T. Lewis, Jr.

JTL:al

James T Lewis, Jr.
President

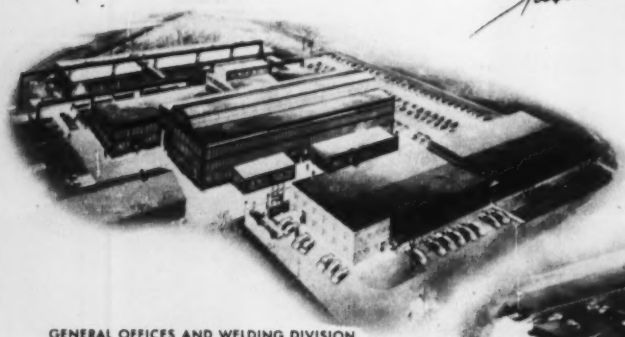


SPECIAL MACHINERY
This high-production 100-h.p. lathe was custom-built by LEWIS.

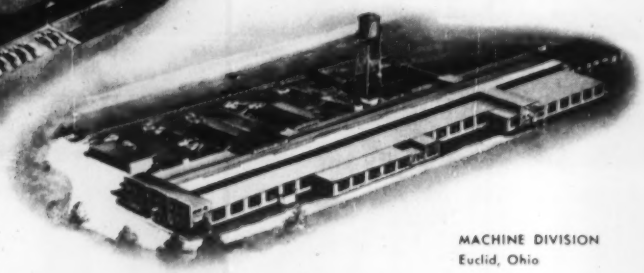


FINISHED COMPONENTS
This roller straightener was built to exacting customer specifications by LEWIS.

PRECISION WELDMENTS
Massive press base being welded automatically



GENERAL OFFICES AND WELDING DIVISION
Bedford, Ohio

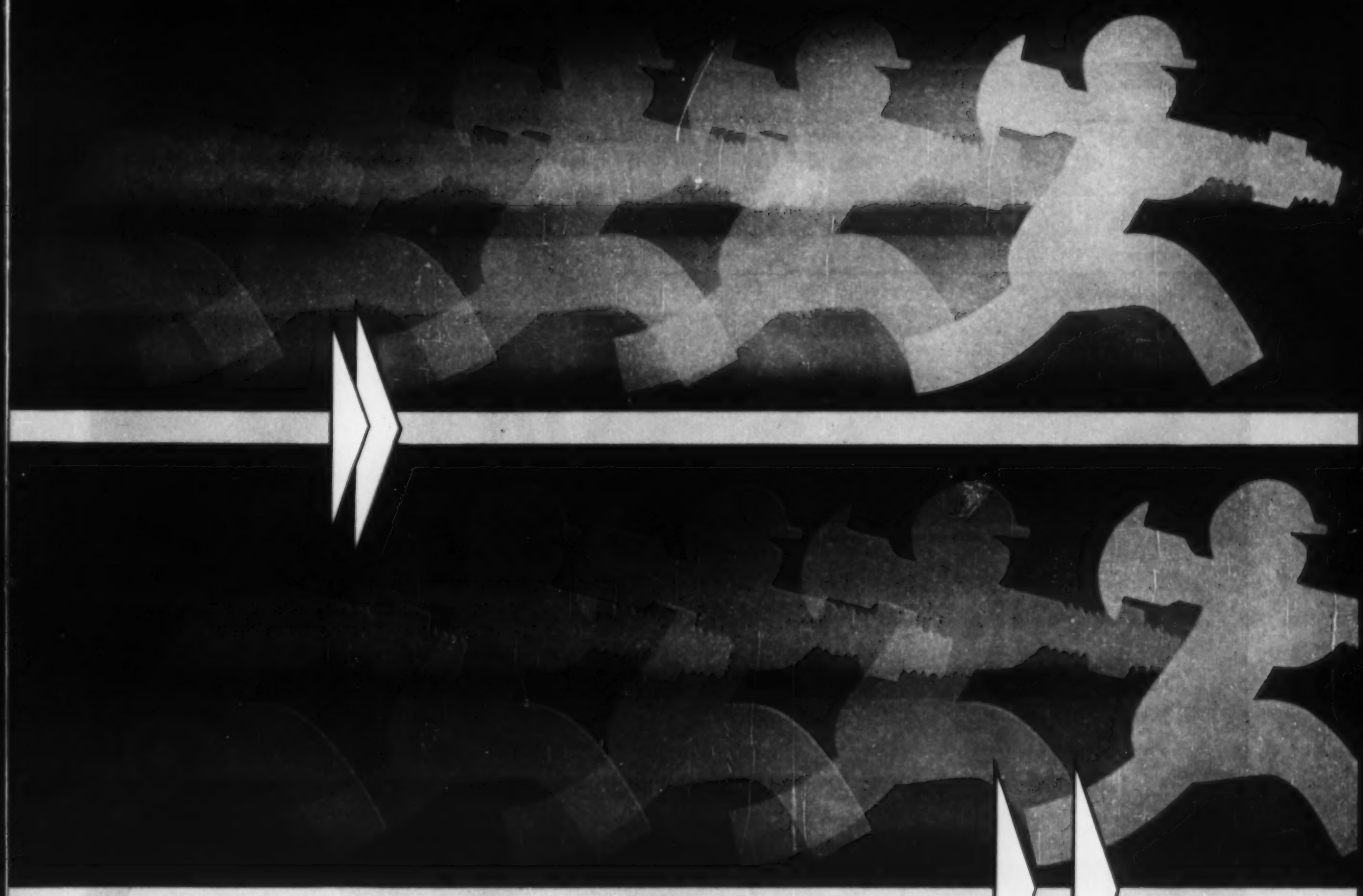


MACHINE DIVISION
Euclid, Ohio

LEWIS

THE LEWIS WELDING & ENGINEERING CORPORATION
15 INTERSTATE STREET • BEDFORD, OHIO

3072-L.W



THE *DIFFERENCE* IS *Service!*

A bolt is a bolt — and a nut is a nut — *granted.*

But Sterling Bolt customers get America's best service on the greatest possible range of metal fastenings. It's a fact. It has been a fact for 35 years. *Send your next inquiry to the Sterling Bolt Company — where the Real difference is service.*

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General Offices: 363 West Erie Street • Chicago 10, Illinois

Manufacturing Plants: Chicago • Milwaukee • St. Louis

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Industrial Gears & Speed Reducers

LimiTorque Valve Controls

How temperamental can a piece of steel be?

● Plenty! Because steel is one of the most *versatile* of all materials, it can play tricks on you . . . can be mighty temperamental, even obstinate. But, properly controlled, it works for you precisely the way you want it to!

For generations, National-Standard's Athenia Steel Division has specialized in the behavior engineering of high carbon steel for the most exacting services. Here, they've learned how to take the fullest *advantage* of steel's versatility. It results in specially engineered, rigidly controlled steels that do a *better* job in all kinds of products from umbrella ribs and pen points to camera springs and piston rings.

Perhaps defense production brings you new problems in the application or behavior of steel. National-Standard and Athenia offer you the kind of engineering and development service that has speeded production and cut costs for many and many a manufacturer.

NS
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DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	**Flat, High Carbon, Cold Rolled Spring Steel**
NATIONAL-STANDARD	*Niles, Mich.*	**Tire Wire, Stainless, Fabricated Braids and Tape**
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WAGNER LITHO MACHINERY	*Jersey City, N. J.*	**Metal Decorating Equipment**
WORCESTER WIRE WORKS	*Worcester, Mass.*	**Round and Shaped Steel Wire, Small Sizes**

smooth, direct parts flow

for short or long runs

Because of its superior ability to take off center die loads, the Henry & Wright Dieing Machine widens the ways in which you can use the economies of progressive stamping. Add to this basic advantage the accessibility of the H & W Dieing Machine for quick die changes.

Now tie the two together and you have a high speed, low cost production method that affords the maximum degree of flexibility in tooling. Jobs can be completed according to the toughest schedules. Short runs can be mixed with long runs. Assembly tooling can be readily incorporated. Your planning becomes a direct and simple matter of figuring so many completed parts per minute or hour per machine.

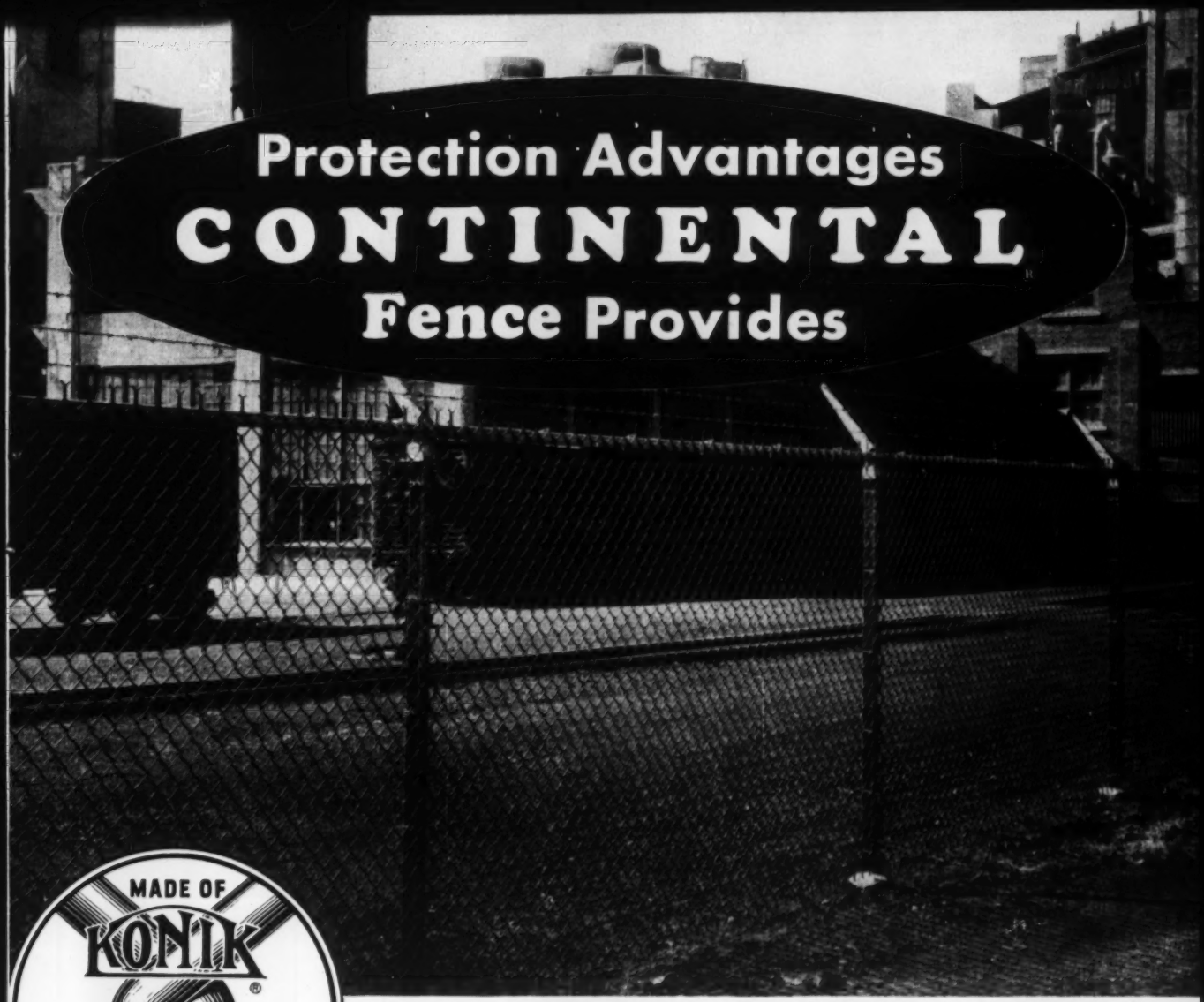
Most important, too: you cut your stamping costs below your best expectations and you improve parts quality.

Get the facts about H & W Dieing Machines by writing to Henry & Wright, 441 Windsor Street, Hartford, Conn., for Catalog 54.

HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.

HARTFORD, CONNECTICUT



Protection Advantages CONTINENTAL Fence Provides

MADE OF KONIK® STEEL

Konik steel contains copper, nickel and chromium for greater strength and rust resistance.

- **Reduced Expense in Guarding Property**
- **Controlled Entrance and Exit to Property**
- **Security in Labor Difficulties**
- **Fewer Accidents—Reduced Liability**
- **Increased Outdoor Storage Space**
- **Reduced Fire Risk, Lower Insurance Rates**
- **Better Appearance, Higher Property Value**
- **Lasting Protection against Theft, Vandalism**

CONTINENTAL STEEL

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Producers of

Manufacturers Wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Lacquer Finished, Bright, and Special Wire. Also, Coated and uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

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Kokomo, Indiana

Please send free copy of your "Planned Protection" manual without obligation.

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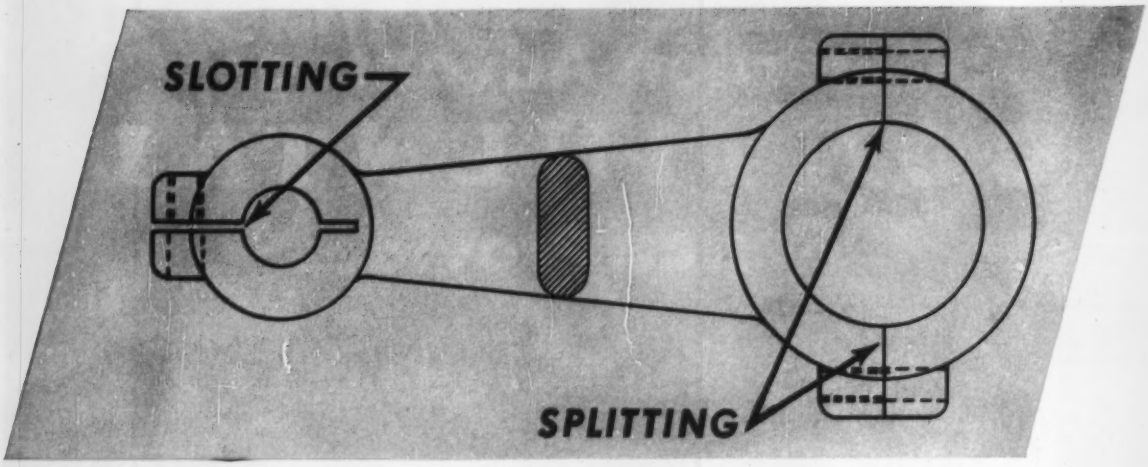
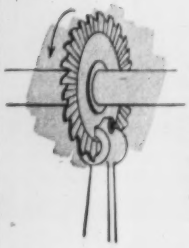
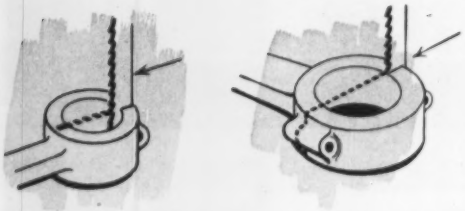


Here's a job for band machining!



THE OLD WAY

Slotting and splitting the part shown above would cost twice as much on a milling machine as on a DoALL band machine. And, use of the DoALL machine would free the much more costly unit for other work.



THE NEW WAY

For slotting, the band machine set-up time is less, cutting rate faster and tool cost lower than with milling.

Cutting at the rate of 4 to 6 or more square inches per minute the saw band makes short work of this splitting job.

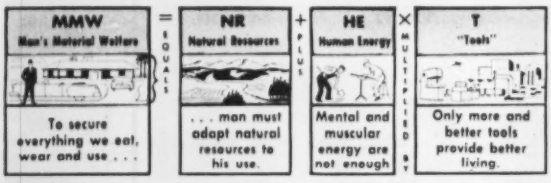
THIS is a representative part showing you two typical operations on which production band machining can cut costs a third to 50% or more. Slotting operations can usually be done best by power feed bandsawing. Splitting is another natural for this newest machining technique.

With the simplest fixtures to position the workpiece on the hydraulic power feed table, it is fed automatically into the continuous-cutting saw band. Upon completion of the cut the table automatically reverses.

Power feed, coolant system, wider speed range, greater power and new Demon *high speed steel* blades make new DoALL band machines amazing cost-cutters on production line operations.

Ask to see a free demonstration of production band machining at your plant. No obligation.

The DoALL Company, Des Plaines, Illinois.



Ask for free chart: "WHY LIVING IMPROVES IN AMERICA." 17" x 22"—suitable for bulletin boards. Contains no advertising.

DoALL band machines, saw bands, precision surface grinders, granite surface plates, tool steel and precision measuring instruments are available through 38 DoALL Sales-Service Stores which also stock a complete inventory of cutting tools such as taps, reamers, twist drills, cutters and single point tools.

DoALL

PB-5

Call DoALL—see classified directory for number of nearest store.

Need help on molding practice?

His knowledge of foundry operations is based on years of actual foundry experience plus a thorough knowledge of all types of pig iron.

Hundreds of foundrymen regularly keep in touch with the Republic Pig Iron Metallurgist. They rely on him to help solve foundry problems or answer questions on molding practice.

Frequently he is called in to make an operational survey. His recommendations often result in improved foundry operation, increased production efficiency and unit output with no increase in overhead costs.

Republic, the only producer of a complete line of merchant pig irons, offers you this metallurgical service without cost or obligation.

Write, wire or phone us when you would like to have a Republic Pig Iron Metallurgist call at your plant.

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REPUBLIC PIG IRON

REPUBLIC STEEL

G.E. announces new d-c brake

ONE ADJUSTMENT FOR BRAKE LINING WEAR CUTS MAINTENANCE TIME

USING AISE DIMENSIONS, General Electric's new d-c brake is designed to simplify and speed brake maintenance. *One* easy adjustment compensates for lining wear on *both* brake shoes. Even when there is unequal wear on the linings, a self-centering fulcrum automatically compensates both shoes when you make the single adjustment.

Power connection, torque setting and shoe adjustment are all made at one end of the brake with only a wrench. No need to keep both ends clear for servicing—permits mounting in comparatively inaccessible locations.

Save time, too, in replacing worn linings. Simply remove two bolts, slide the old lining out. You can remove coils without the necessity of disassembling the entire magnet structure.

FOR MORE INFORMATION, write for the new descriptive bulletin, GEA-6214, or contact your nearest G-E Apparatus representative. Section 780-6, General Electric Company, Schenectady 5, N. Y.

ARMATURE GAP INDICATOR—this easily visible indicator shows when to make adjustment for lining wear.

MANUAL RELEASE—this convenient mechanism provides a positive method of manually releasing the brake.

STRONGBOX MAGNET COIL—seals out dust, moisture, oil. Windings protected from mechanical damage.

TERMINAL STUD CONNECTIONS—speeds wiring—protects magnet leads from strain. Easily accessible.

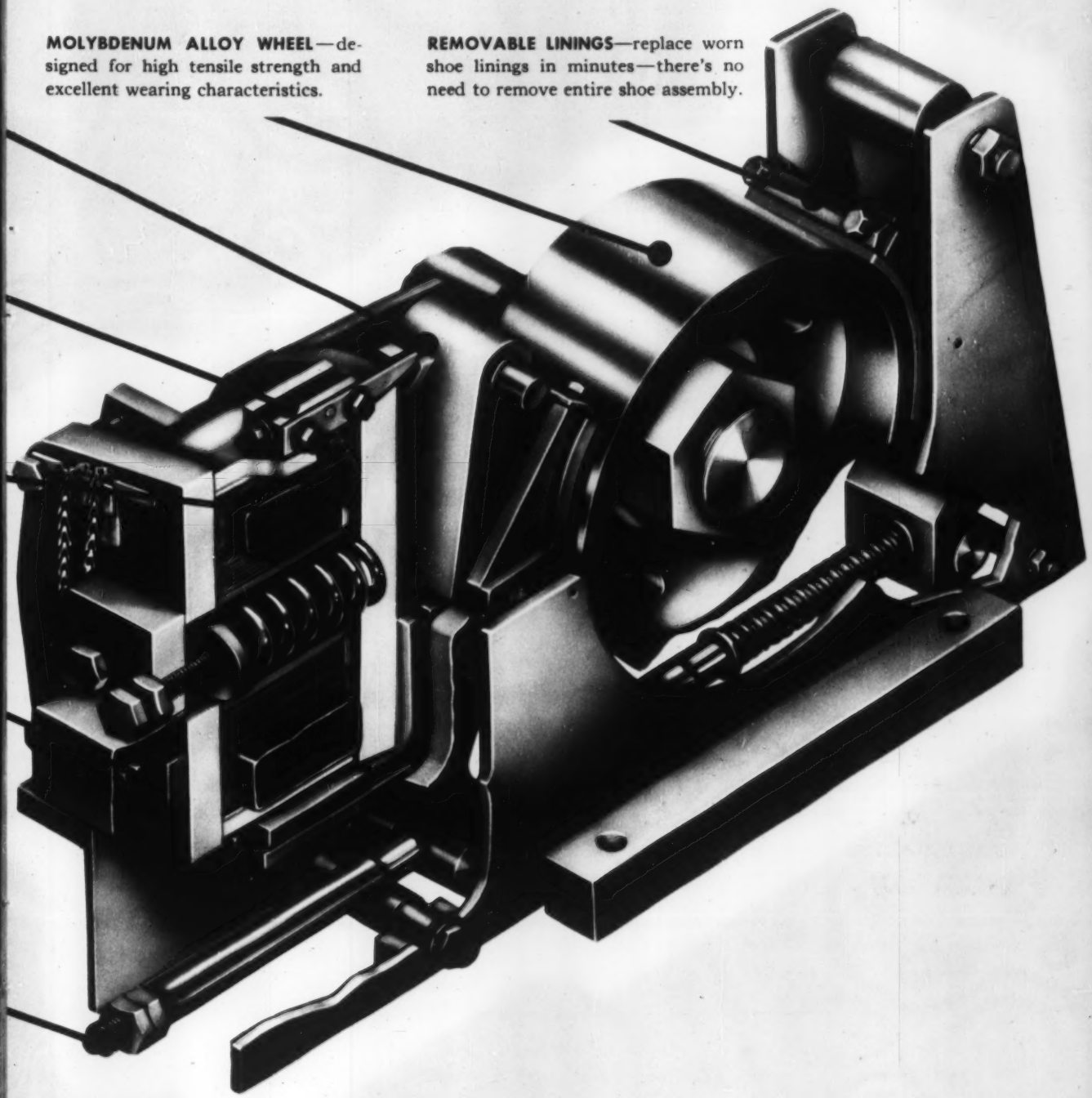
FIELD-TESTED—Assistant Maintenance Foreman at Jones & Laughlin Steel Corp. makes check on new brake during on-the-job tests. Brake was also thoroughly lab-tested by G.E.

SINGLE-POINT ADJUSTMENT — one simple adjustment for lining wear speeds maintenance. Only a wrench is needed to adjust magnet gap. Equal shoe clearance is obtained automatically. No trial-and-error adjustment—brake is designed to be self-centering.

built to AISE Standards

MOLYBDENUM ALLOY WHEEL—designed for high tensile strength and excellent wearing characteristics.

REMOVABLE LININGS—replace worn shoe linings in minutes—there's no need to remove entire shoe assembly.



SEE G.E.'S NEW BRAKE AT THE IRON & STEEL SHOW, CLEVELAND, SEPT. 28—OCT. 1.

GENERAL ELECTRIC

REDUCE REDUCTION GEAR WEAR

WHEN YOU use *Texaco Meropa Lubricant* you'll get the effective lubrication that means greater protection against wear . . . assures longer life for gears and bearings and smoother, quieter operation.

Texaco Meropa Lubricant has notable EP characteristics that stand up through long service of the severest kind. In addition, *Texaco Meropa Lubricant* resists oxidation, does not thicken or foam, does not separate in service, storage or centrifuging.

In the circulating systems of your roll stands, use *Texaco Regal Oil.* This turbine-quality oil has outstanding resistance to oxidation and sludging, will give the bearings of your back-up rolls full protection.

For greater operating efficiency and lower costs throughout your mill, call in a Texaco Lubrication Engineer. Just contact the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

STEEL

September 6, 1954

Metalworking Outlook

Coming: New Defense Equipment Plans

Planned Defense department retrenchments in equipment have been abandoned because France won't join the European Defense Community. New plans, to call for more extensive U.S. rearmament, will be ready by November and submitted to Congress next year. A word to the wise: Review all the military components you ever made. A lot of changes in requirements have come even in the past few months, but the check will give you a general picture of what you can produce. Major companies wanting more detail about changing needs can contact J. Lewis Powell, Room 2E829, the Pentagon, Liberty 5-6700, Ext. 56969.

Fast Aid to Shipbuilding

Aid to shipbuilding is coming fast. Within an hour after the President signed the $30-million appropriation bill for new tankers, the Maritime Administration sent out bid invitations for four 25,000-ton units. It also has awarded General Electric Co. a contract for a gas turbine to be installed to power a Liberty ship. And it has sent out invitations to bid for installation of a steam turbine on another Liberty. Turbine experiments will seek ways to rejuvenate the 1500 Liberties in mothballs.

Why the Economy Is Healthy

Here's the big reason why the economy is still healthy: For the first seven months this year personal income equaled an annual rate of $286.6 billion, $200 million above the like months in 1953. That explains why housing construction is so excellent, why appliance sales are good. And the income level augurs well for sales of 1955 autos.

1954: More Peaceful Labor Year

The number of strikes has been increasing since unusually low levels early this year. But 1954 still promises to be the most peaceful labor period since the end of World War II. In the first seven months, only 0.20 per cent of total estimated working time was lost in stoppages. If that rate continues, this year's performance will be even better than 1951's 0.23 per cent, the postwar record.

The Unions Slip—a Little

Unions are winning fewer representation elections. The time was that when a union got the National Labor Relations Board's consent to hold a vote on whether it would represent unorganized workers, the verdict almost invariably favored the union. Labor is still winning the majority of those contests, but the average has slipped. And observers think it will slip still more now that NLRB has liberalized free-speech rules (p. 51). You can talk more readily with your employees to give your side of the case.

Trial at Lawrence, Mass.

Watch Lawrence, Mass. A special task force named by Commerce Secretary Sinclair Weeks has begun an on-the-spot study of manufacturing

Technical Outlook—p. 91 Market Outlook—p. 127

potentials of the city. Object: To increase its business and employment. Hard hit by the loss of textile plants to other areas, Lawrence is a surplus labor area. The project there will be a test survey to develop a pattern for other surplus labor sections.

UAW Takes a Flyer

United Auto Workers-CIO is in business—selling Kaiser and Willys cars. UAW's Local 12 has been trying to get a franchise but was turned down last July by Kaiser Motors Corp. Undaunted, union officers have been dickering with Laurel C. Worman Inc., Ohio-Indiana-West Virginia distributor of Kaiser-Willys products, for a dealership at the K-W factory showroom. Worman agreed. Now Ohio Sales & Service Inc. is a union-sponsored business and will get into actual operations about Oct. 1 when 1955 models come out.

The Glitter Fades

Plating jobbers reveal their business-volume glitter has been diminishing steadily for 18 months. A survey by National Association of Metal Finishers shows: Sales for the first six months of 1953 were down 10 per cent from the last six months of 1952; sales for the last six months in 1953 slipped 13.4 per cent from the first half; sales for this year's first six months skidded 15.1 per cent from the previous half. For the first six months last year, commercial platers report 37.5 per cent of their volume was defense work. That dropped to 31.1 per cent in the next half and was down to 24.4 per cent in the first six months this year.

Straws in the Wind

Republic Steel Corp., Allegheny Ludlum Steel Corp. and Sharon Steel Corp. have applied for fast tax amortization to build titanium rolling facilities . . . A book to interpret contract termination procedures outlined in Sec. 8 of Armed Services Procurement Regulations is available from the Chamber of Commerce of the U.S. . . . Mack Trucks Inc. has broken off merger talks with White Motor Co. . . . Nordic Mining Co. has discovered lead and zinc deposits worth an estimated $15 million at Mestersvis, Greenland . . . American Can Co. and United Steelworkers of America reached an agreement a month ahead of the Sept. 30 deadline on terms that parallel the basic steel contract.

This Week in Metalworking

Labor tries on long pants (p. 49) . . . National Labor Relations Board shifts toward center (p. 51) . . . How voluntary committees in Toledo and Louisville help solve labor problems (p. 52) . . . Corrugated aluminum roofing is available in rolls (p. 54) . . . Here's a metalworking executive who does something—besides talk—about the weather (p. 55) . . . Odds are that the U.S. would have no objection to a merger of Youngstown Sheet & Tube Co. and Bethlehem Steel Corp. (p. 56) . . . Vending Machines: Silent selling is booming (p. 60).

To cut perfect threads

7 Points of uniform goodness in YOUNGSTOWN PIPE

- uniform ductility
- uniform lengths
- uniform threading
- uniform weldability
- uniform wall thickness and size
- uniform strength and toughness
- uniform roundness and straightness

Youngstown

QUALITY · YOUNGSTOWN · SERVICE

●When the mechanical threader goes to work on Youngstown pipe, you can depend on it that the threads cut will be perfect and leak-proof. That's because the steel is of highest quality, controlled by a single manufacturer from ore mine to final inspection of the pipe.

THE YOUNGSTOWN SHEET AND TUBE COMPANY Manufacturers of Carbon, Alloy and Yoloy Steel

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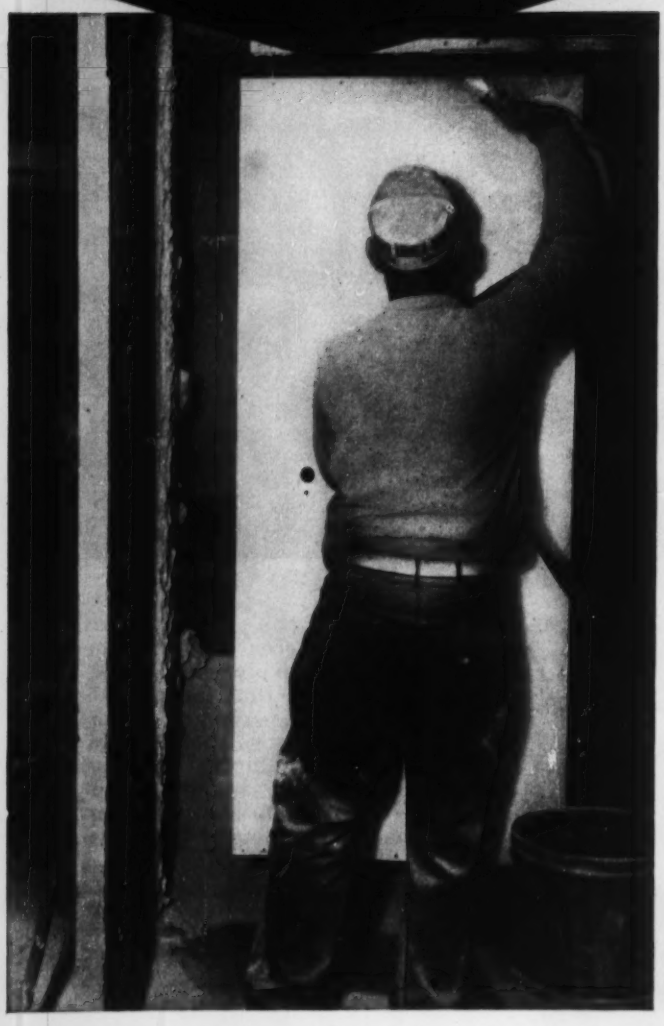
Saves 2½¢ a square foot on paint costs, boosts production 40% with this Special Steel



Here's how one manufacturer boosted production and saved money—including 2½ cents a square foot on paint cost. He changed over from regular cold-rolled steel to Armco Cold-Rolled PAINTGRIP, a cold-rolled sheet with a mill-applied phosphate coating over an electrolytic flash of zinc.

Saves on Cleaning Costs

Armco Cold-Rolled PAINTGRIP is shipped dry; cold-rolled steel was shipped oiled. Therefore, Cold-Rolled PAINTGRIP is much easier to clean in preparation for painting.

Eliminates Primer

Armco Cold-Rolled PAINTGRIP eliminated the necessity of a primer coat, formerly required for both sides of the panel. Figuring paint coverage at 200 square feet a gallon, the primer cost 2 cents a square foot per side or 4 cents a square foot for both sides. The additional cost of Armco Cold-Rolled PAINTGRIP is about 1½ cents a square foot for 20-gage material. Yet by eliminating the primer cost of 4 cents per square foot, *there is a net saving of 2½ cents a square foot.*

Increased Production, Too

The manufacturer has limited painting capacity. By eliminating the primer coat, he estimated 40 to 50 per cent greater production with no increase in facilities. This made possible a large operational saving.

Holds and Preserves Paint

Tests show that paint lasts several times longer on Armco Cold-Rolled PAINTGRIP than on regular cold-rolled steel. There is no premature flaking or peeling because the paint-holding surface also *helps preserve paint.* Armco Cold-Rolled PAINTGRIP is recommended for flat or drawn parts where long paint life is essential and where an extra-smooth finish is desirable.

For complete information write for the booklet, "Armco Cold-Rolled PAINTGRIP."

ARMCO®

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Export: The Armco International Corporation

Radical Face Lifting

During the last few years there have been numerous mergers in the metalworking industry. So much emphasis has been placed upon them there is danger some of us may jump to the conclusion that consolidation is the dominant characteristic of industrial evolution today.

It is important, but not necessarily dominant. A careful examination of what is going on in the metalworking industry will show clearly there are other changes affecting the character, ownership and location of plants that may be much more significant than mergers.

For every merger there are dozens or scores of cases where new plants sprout from old ones. A favorite, time-honored method is for an ambitious man in an established company to break away from it and start a similar business of his own. Thousands of older companies today are competing with younger companies founded and operated by alumni.

Another significant offset to mergers is the present disposition of large corporations to build branch plants in strategic points throughout the country. What Ford, General Motors, General Electric, Westinghouse and other giants are doing in this respect has far greater economic significance than have the much-publicized mergers.

Important, too, is the character and location of new plants. In any metropolitan area of a million population or more will be found three or four relatively new types of industrial development. Seven or eight miles out from the center will be found the new large plants, each employing thousands. From 10 to 12 miles out will be found attractive, light manufacturing establishments, nicely landscaped, each employing several hundred persons. Beyond, in the rural districts, are the small shops of the men who became tired of the trek to the city and who, setting up shop in a barn with a few employees, after a few years are employing several score and grossing over a million dollars a year. Also meriting attention are the new industrial "parks" and "centers" keyed to new toll turnpikes.

The face of industrial America is changing radically. Don't make the mistake of clinging too long to outmoded concepts of advantageous plant location.

E. L. Shaner

EDITOR-IN-CHIEF

UNIONISM GROWING UP: Labor Day, 1954, witnesses more indications than ever before that American labor unions are becoming more mature and responsible. Two signs (p. 49), which are typical of many others, are the willingness of union members to take a re-

duction in wages to help Studebaker to better meet competition and the unusual orderly negotiations of the new steelworkers' contract.

In these instances, one can say that the slower pace of industrial activity and its resultant effects upon employment and competition place strong pressure upon union leaders to be more reasonable in their demands upon employers. But in many situations, union bosses have yielded more or less gracefully to the pressure of changed economic conditions, instead of bucking them stubbornly—a sign that unionism is shaking off some of the immaturity and recklessness of youth and inexperience.

The unions whose leaders are wise enough to realize that there is a time to yield as well as a time to take are fortunate. Their members will benefit in the long run.

A NEW SLANT ON NLRB: Another factor bound to have a strong influence of labor-management relations in the future is the policy of the National Labor Relations Board. So far this year the policies of this agency have been changed more sharply than at any time since NLRB was established in 1935.

As a result of new appointments to the board by the Eisenhower administration (p. 51), rulings and interpretations of existing labor laws have been shifting more and more from left to center. In the early days of the Wagner act, NLRB was administered by New Deal appointees purely for the benefit of favorite union leaders. When the Taft-Hartley act became law, the personnel of NLRB still was so partial to the Wagner act policy that no fair trial of T-H ever was possible.

Today, for the first time NLRB is attempting to interpret the labor laws with a conscientious view of the public interest.

ACE TROUBLE SHOOTERS: Labor-management committees in Toledo, O., and Louisville have demonstrated clearly that properly organized civic agencies can pay handsome dividends by reducing friction between employers and employees. In eight years Toledo's Labor-Management-Citizens Committee (p. 52) has settled nearly 600 labor disputes. Since the Louisville committee was organized in 1948 it has participated in 137 negotiations.

The cost of the committees is paid by the city governments of Toledo and Louisville. It is modest—under $16,000 annually for each city—only a director and secretarial help are paid. Panel assignments are rotated among industrial executives, union officials, judges, educators, clergymen and other qualified leaders. These civic-minded individuals serve without pay.

An employer whose labor difficulties had been smoothed out by one of these panels exclaimed, "Where could you buy consultation talent like that!"

GOOD JOBS AVAILABLE: Labor Day is an appropriate time to comment upon a labor situation which seems to be getting worse instead of better. In an important midwestern industrial area there are about 30,000 persons either unemployed or on such meager hours per week that they are seeking better jobs. In the same area there are a score or more of companies which are advertising for skilled workers. One employer, advertising for 1000 men, was greeted by only 150 at the employment office on the first day.

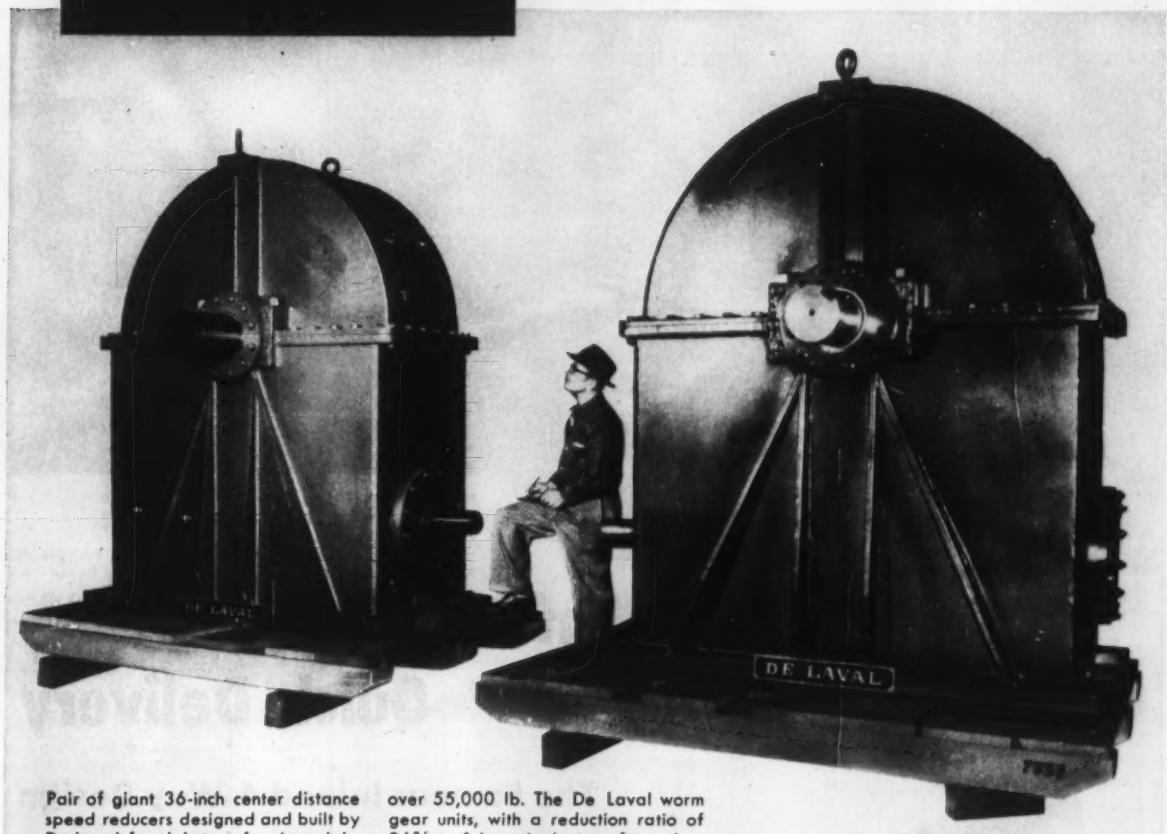
The key point in the situation is that technological progress is creating more jobs for skilled persons and fewer jobs for the unskilled. The obvious lesson here is that we should be moving heaven and earth to prepare workers for the higher job requirements.

AUTOMATION FOR $3000: One can apply automation effectively to relatively simple operations. For instance (p. 98), a manufacturer was cutting 8-gage, ¾-inch-wide cold-rolled steel strips into 1¾-inch lengths and drilling and tapping two holes in each piece. These simple operations were performed by hand on a simple press and on two single-spindle drilling machines. The labor cost per 1000 pieces was $16.875.

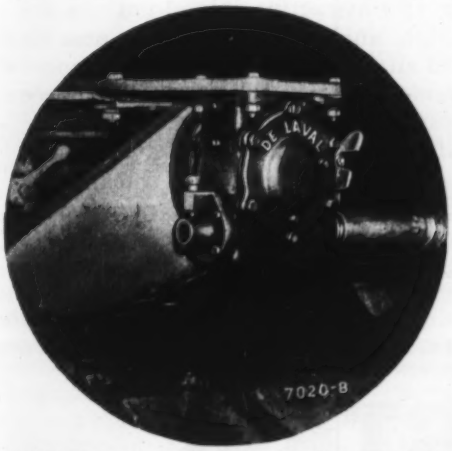
These operations were automated by tying together the same equipment at a cost of less than $3000. The labor cost per 1000 pieces produced under automation is $2.25. This represents a cost reduction of nearly 90 per cent as a result of a small investment in the simplest kind of automation. This should indicate clearly that one does not have to have a complex operation to enjoy the fruits of automation.

DE LAVAL
SPEED REDUCERS

from dwarf to giant size



Pair of giant 36-inch center distance speed reducers designed and built by De Laval for slab transfers in a slabbing-blooming mill. These slab transfers are used to convey steel slabs up to 12 in. thick and 42 in. wide, weighing over 55,000 lb. The De Laval worm gear units, with a reduction ratio of 26⅔ to 1 in a single set of gearing, are each driven by a 200 hp, 410 rpm motor coupled directly to the input shafts of the slab transfers.



Here's one of the smaller De Laval worm gear speed reducers with a 3″ center distance being used for a new coal drilling machine.

De Laval heavy-duty worm gear speed reducers seldom require attention under the most rugged operating conditions. They make a quiet, close-couple compact drive. They permit high ratio reductions in a minimum of space and withstand severe shock loads without damage. De Laval builds all sizes from 3″ to 36″ center distances for transmission ratios of 3.1:1 to 100:1 in single reduction units and ratios of 50:1 to 8000:1 in double reduction units. Whether you need dwarf or giant worm gearing, consult De Laval for engineering assistance. *Send for De Laval Manuals G-WBV and G-WWH containing data on single and double reduction units.*

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The lugs in this attractive Inland pattern are hot rolled at right angles to each other to provide safe footing in all directions. There are no pockets where liquid or dirt can collect, so the surface is easy to drain and sweep.

This firesafe, long-lasting plate is available in two pattern sizes and a wide range of thicknesses. You can order it sheared, bent or punched to your specifications. Our stocks are complete—and we can assure you of immediate shipment.

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A change has taken place since that riotous labor scene 17 years ago. More common now is the amicability of this meeting between Benjamin Fairless and David J. McDonald

NEA

Labor Tries on Long Pants

HIS NAME is Joe Williams. He's a college graduate in his early thirties, has a wife, three children and a seven-room house for which he paid $24,500. He looks like a successful salesman for U. S. Steel or a promising junior executive at General Motors. He's neither; he's a union official.

There's nothing too unusual about his presence in the union movement anymore, but he deserves mention because he epitomizes the changes that have evolutionized organized labor since 1937.

Turn-About—The Joe Williamses of 1937 probably would have been with U. S. Steel or GM. The organized labor movement of that day was young, immature, a bundle of random activities. Its leadership was the same and also rough, tough and often pro-Communist. Admittedly, it sometimes had to be because of business management's too-frequent primitive concept of industrial relations. Despite that primitiveness, or perhaps because of it, labor had just won important victories in industry and had ever-increasing political influence. It didn't want any Joe Williamses.

Today, organized labor still is guilty of violence occasionally, still indulges in jurisdictional warfare, Communists in its ranks. That now is the exception, not the rule.

Shift Toward Statesmanship—Industrialists contacted by STEEL agree that the most heartening change in labor in the past 17 years has been its more statesmanlike attitude. Last month Studebaker Corp. workers voluntarily voted to drop an incentive pay plan to help keep the operation going. The vote means a pay cut of about 14 per cent. Willys' Local 12, United Auto Workers-CIO, in April voted out incentives. American Motors Corp. currently is negotiating with the UAW for contract changes that will involve sacrifices by the workers.

When, last spring, U. S. Steel Corp.'s chairman, Ben Fairless, and United Steelworker's president, Dave McDonald, went on a goodwill tour of all the corporation's plants, that was a unique experiment in industrial relations. Union members who remembered conditions in 1937 were aghast, but the success of the experiment is an established fact. Now both sides are considering quarterly sessions to iron out the smaller matters they don't have time to study at the annual contract parleys. Jones & Laughlin Steel Corp. already holds meetings each quarter, usually quiet, unpublicized affairs.

Toward Real Bargaining—Industrialists also commend the trend toward true collective bargaining. One electrical company industrial relations expert points out: "The

unions we deal with don't run to Washington for back-door help as much as they used to. They don't threaten us with gimmicks like the sit-down strike anymore. I think they are more aware that they can hurt their own cause with too much federal intervention, too much gimmickery."

More unions are willing to participate in local dispute-settling agencies, too. The labor-management-public committees in Louisville and Toledo to stop strikes or prevent them (see p. 52) are strongly backed by unions.

A More Neutral Government—As the government, via the courts and the National Labor Relations Board, shifts more toward center (see p. 51), organized labor has also shown its growing maturity.

Some of its greatest gains have come under Taft-Hartley—especially in the past year and a half, when NLRB has been markedly moving toward center.

More Responsible Leadership—Also a notable advance from 1937 is the responsibility of union leaders. They will now admit some areas where reform is needed. For example, the American Federation of Labor has announced in advance that two of the problems on the agenda of its annual convention in Los Angeles (starting Sept. 20) will be warfare between competing AFL unions and frauds in the management of union welfare funds.

The AFL-CIO no-raid pact is another union-initiated attempt to clean its own house. Organized labor has also taken the initiative in throwing out Communists. The expulsion of the Red-led United Electricalworkers from the CIO in 1949 is a prime example.

The Reason Why—What's the explanation of the trend toward more lunchpail statesmanship? Management is more enlightened. Labor has greater maturity. Jurisdictional disputes are handled better. The labor laws and their interpretation by NLRB and the courts have encouraged more stable contractual relations. The changing economy, especially in the past year, has forced statesmanship.

Progress has been made, but industrialists—and labor leaders—see where more is needed. Here are some often suggested reforms:

Measured Output—It's still a tacit policy of union leadership not "to kill the job." The lives of workers with exceptional production rates are too often made miserable until their output slips down to the "normal level."

International Pressure—The international frequently forces locals to insist on some demand because it's the headquarters' policy. The demand may be impossible to meet because of some local condition. The local leadership realizes this but has to go along. Needed is more local autonomy.

Poaching on Management—Many an international appears more concerned with winning a clause that gives it a foot in management's door than with winning actual benefits for the workers. Unions should not limit management's movement of equipment and men.

Democracy—Labor must give its members more voice in formulating demands, a greater say about striking. One union conducted a strike vote by passing around slips of paper. If a member wanted to vote for a strike, he was to pass in his slip blank. If he wanted no strike, he was to write "no." Not one member in 20 at the meeting had a pencil with him. The strike O.K. was voted by 20 to 1.

Juniority—Labor contracts and union policy tend to favor the senior members. For example, many contracts call for a reduced work week for all in case of declining business. When that is put into effect, it frequently lasts for only a month or so. Then, the older workers start pressuring for layoffs of younger men, and they have won their point in many cases by getting the union to go along with them. Needed is a compromise, perhaps like what the UAW is now trying. It is writing contracts providing a reduced work week for a while, then layoffs.

Reform in these six areas must be initiated by top union leadership. If unions don't come up with improvements, they will be accomplished by compulsory laws, especially on strike votes.

Enlightened union officers—and there are lots of them—recognize that they will help their own cause by cleaning their own house. That's why they are attracting more Joe Williamses to help labor get into long pants.

These Labor Decisions . . . . . .

Buffalo Line Supply Case

When a union strikes against one company to coerce other companies can a company lock out its employees as a protective measure? "No," said the old board. "Yes," says the new NLRB, if there is a threat that the union is picking off the employers one by one.

Lion Oil Co. Case

Under former rulings unions were free to strike at any time during a contract providing the 60-day cooling-off period was observed. Under the new board's decision in this case, a union can't strike over contract demands except when a contract permits by its own language the alteration or termination of the contract. A 60-day notice of intention is still required.

Ludlow Typograph Case

The old board ruled that representation elections were not allowed during the first year after certification of the union by NLRB. Now the representation status may be challenged by a rival union within a year after certification if the union contract expires or is subject to renewal within that year.

Personal Products Case

New NLRB ruled that unions while engaged in negotiations can not engage in organized slowdowns, unannounced walkouts and refusal to work overtime. These are held to be harrassing tactics and to be in bad faith. Also considered showing "bad faith" at

NLRB Interpretations Shift Toward Center

. . . . . Indicate a New Trend

bargaining time are offers of wage increases to employees by employers.

Bausch & Lomb Case

Here the union tried to enforce bargaining rights with the company while at the same time it was the owner of a competing business of the same kind in the same locality. Ruled the board: Union forfeited its rights to represent company employees.

Blue Flash Express Case

May an employer question his employees individually about their union membership and attitude? "No," claimed the old board, he should petition for an election. "Yes," says the new board, as long as he's not trying to scare them out of the union.

Pacific Telephone & Telegraph

In this case, the first time the issue has been ruled upon, NLRB described a "hit and run" strike as a form of economic warfare beyond the pale of proper strike activities protected under T-H.

●

Harris-Ewing

Members of the present National Labor Relations Board are (l. to r.): Phillip Ray Rodgers, Abe Murdock, Guy Farmer, Ivar H. Peterson and Albert C. Beeson

GOVERNMENT supervision of labor-management matters is beginning to come of age.

In the labor law adolescent period of the Wagner Act, enacted in 1935, the balance of power swerved sharply to the side of the unions. But experience with the law plus abuse of power by the unions led to the adoption of the Taft-Hartley Act in 1947 which retained many basic features of the Wagner Act and added protection to employees, employers and the public from certain union practices.

What's Happening — Even with the passage of the T-H, many NLRB interpretations reflected much of the old prolabor Wagner Act philosophy. Today's board, three of the five members Eisenhower appointees, is effecting many reinterpretations which are bringing the law more into balance between management and labor (see the examples).

The recent NLRB trend, too, is to exempt many smaller companies from its jurisdiction and to place more of the regulatory powers in the hands of local and state governments (STEEL, July 12, p. 69).

Statistics show that the recent fulminations of labor leaders charging viciousness of T-H and biased NLRB decisions are anticlimactic. In the quarter ended June 30, 1954, more than 61 per cent of the 488 charges filed with NLRB were filed by employees or other unions seeking the protection of the act.

More To Come—Interpreting and enforcing labor-management law is a complicated business and will continue to be because many basic decisions are still to be made. The Ninth Court of Appeals recently ruled on one basic principle: That management can close its plant if it wants to for any reason. This could have been an important issue had Studebaker's employees decided not to take wage cuts and management found it necessary to close its doors.

The President's signing of the anti-Communist bill removed a thorn which had been hampering NLRB in dealing with Communists since World War II. Employers can now get Communists off their payrolls and refuse to deal with Communist-infiltrated or dominated unions.

Grass Roots Approach To Labor-Management Disputes Pays Off

Toledo, O., and Louisville have found that their top leaders in management, labor and public make a mediation team that's hard to beat

LABOR-MANAGEMENT committees that settle industrial problems at the "grass roots" are a welcome indication of maturing relations between unions and management.

Probably the best example is the Toledo (O.) Labor - Management - Citizens Committee. In its eight-year history, it has settled nearly 600 labor disputes. Louisville organized its committee in 1948 and has participated in 137 negotiations.

The Job—The basic job of such committees is to provide a mediation service for labor and management on a local level, but the long-run intangibles accomplished (see the check list) are just as important, says Jerome Gross, Toledo's LMC administrative director.

Here's how the committee operates. Company ABC and its union have reached a point in their negotiations where talks have bogged down—maybe a strike is even hinted. One or the other can appeal to the LMC for mediation; both, however, must agree to bring in the committee.

The Steps—First step is taken by the executive director—the only full-time, paid member of the committee other than secretarial help. He will try to effect a settlement by talking to both labor and the company officials together and individually.

Failing in this, the director may feel a panel is necessary. He'll ask the chairman of the LMC to appoint a panel to enter the mediation to bring in new points of view and persuasive abilities. Normally, a panel consists of three members—it may be more. This body works in the same manner as the director, trying to keep the parties talking until a settlement is reached. If these efforts fail, of course, both parties are free to utilize economic powers.

The Big Ones—In rare instances when disputes affect the entire community, the matter can be referred to the full LMC committee for emergency action. But through-

Here's what a Labor-Management Committee can do.

1. Assist in labor dispute settlements.
2. Lessen suspicion existing between labor and management.
3. Help develop better working relationships in individual plants between unions and companies.
4. Help develop a spirit of co-operation between unions and companies in over-all civic activities.

Do's and Don'ts of Labor-Management Committees

Do	Make sure that all top community leaders approve of and will co-operate in a committee before setting one up.
Do	Let industry and labor nominate their own representatives. Also give each the veto power in the nomination of public members.
Do	Select an executive director who is acceptable to both sides.
Don't	Let politics enter the committee in any way, even if operational funds come from city coffers.

out the process, only the methods of voluntary persuasion are used. In Toledo last year the Ohio Fuel Gas Co. dispute was settled only after 37 members of the committee spent 12 hours in a meeting to help effect a settlement.

Key to the success of a labor-management committee is the acceptance and co-operation of the top leadership in a community — management, labor and public representatives like the judiciary, educational and religious leaders. Toledo has ten representatives from each group in its regular membership and six each in its associate membership. Louisville's committee has six members from each group.

Top Talent—Take the panel mentioned above. In Toledo the members could possibly include District Court of Appeals Judge Amos L. Conn, Electric Auto-Lite Co. President James Falvey and UAW-CIO Vice President Richard Gosser. Commented one small metalworking executive who has used the services of the LMC: "Where could you buy consultation talent like that!"

Committee candidates are nominated by their respective groups—labor selects its members and management its members. Martin Wagner, executive director of the Louisville committee, recommends that both labor and management have an absolute veto power on the nomination of the public members.

Harmony Builder—Louisville and Toledo have periodic committee meetings—Louisville monthly and Toledo quarterly. The biggest value here, say directors, is that the community's top labor, management and public officials sit down together. It's here, too, that many possible future conflicts are avoided. Perhaps a union or management member has a problem he'd like to sound out opinion on. He brings the topic up for discussion informally. In many instances the answers are found before the problem ever becomes a real issue.

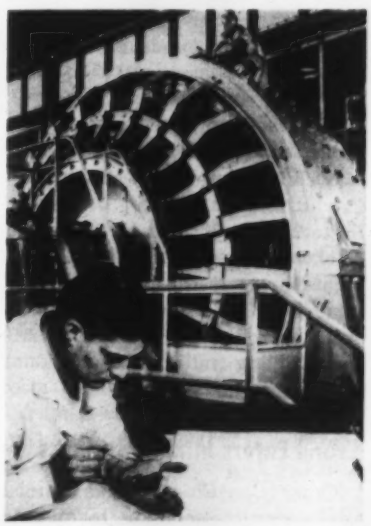
Sometimes arbitration is suggested when the labor-management committee is sitting in on a company-union dispute. Toledo's LMC will draw up an arbitration agreement and will consent to name the arbitrator if the parties can't agree upon one. From that point, however, the case passes into the hands of the umpire named.

Education—A labor-management committee can also sponsor educational programs to promote labor harmony in its community. Toledo's LMC is planning a series of seminars in connection with the University of Toledo this fall. "These are particularly aimed at shop foremen, union stewards and workers at that level," Mr. Gross relates. "That's where most greivances begin. That's where most should end."

What's the cost of labor-management committees? Toledo and Louisville city governments foot the bill for their organizations—$14,300 in Louisville and under $16,000 in Toledo. Only the director and his secretarial help are paid. Panel assignments are rotated among the members. No busy executive has to neglect his company duties. "Besides," explains one, "the committee normally doesn't require any more time than most civic projects we're asked to help with. And this is one that really pays dividends."

Caution — Labor - management committees are no panacea. They do provide a method of getting disputing parties together and of getting some of the best talent in the community to study the problem and make suggestions.

But the main objective, proponents claim, is to get the parties to talk. Then keep them talking until they settle. LMC committees are one way to do it.



Assorted Power

Charles A. Vaughn, a manufacturing research engineer, holds a 1/1000-horsepower motor used to power precision laboratory instruments in Ford Motor Co.'s Dearborn, Mich., plant. In the background is a 7000-horsepower motor which turns rollers that shape 14-ton steel ingots

Auto Parts Sales Indexed

Automotive Parts Manufacturers Association index shows sales strengthening in 1954

MANUFACTURERS' SALES of automotive replacement parts will no longer be a mystery. The Automotive Parts Manufacturers Association (APMA) has worked up a new index to chart such sales.

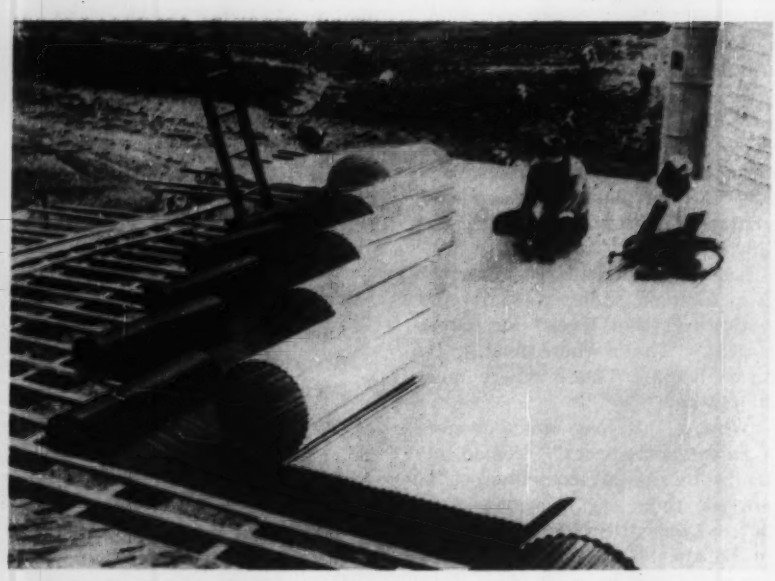
Development of the index represents the first time an accurate measure of the industry's sales of replacement parts has been available. It's expected to be one of the better business indicators for the automotive industry.

How and What—The seasonally corrected quarterly index numbers (1947-1949 = 100) show second quarter, 1954, and first half, 1954, sales are below last year's volume, but second quarter was an improvement on first quarter, 1954. The second quarter increase was due entirely to May and June sales, since April was the lowest month of 1954 thus far.

	1952	1953	1954
1st Quarter	109.2	111.5	105.6
2nd Quarter	101.0	117.4	108.5
3rd Quarter	102.3	114.4	
4th Quarter	107.9	108.4	

Sales for second quarter, 1954, were 2.7 per cent higher than first quarter, 1954, but they were off 7.5 per cent from the second quarter, 1953, reports APMA. Sales for the first half of 1954 were 6.5 per cent less than the same period in 1953, but 1.9 per cent above the like period in 1952.

Inflated Dollars—APMA points up dollar inflation since 1948 by noting dollar sales for 1953 were only 1 per cent under 1948 (highest dollar sales year in the history of the industry), but unit sales were off about 19 per cent between the two periods.



Bigger business in building is the aim with a . . .

New Aluminum Wrinkle: Corrugated Roll Roofing

COURTSHIP of the building trade by aluminum companies has built it into the light metal's biggest market, and the wooing isn't over yet.

Building takes about one-fifth of all primary aluminum, some 18 times its prewar tonnage. Now the metal is making a play for a larger share of the half-billion-dollar metal roofing industry with a corrugated roofing and siding supplied in continuous rolls for easy installation. A product of Quaker State Metals Co., Lancaster, Pa., the roll roofing is said to save about 12.5 per cent in metal, though it costs about 10 per cent more than sheet.

The Plus Side — Advantages claimed for it:

Rolls can be handled in much the same manner as composition roofing.

Side laps are eliminated, to save material. End laps need be only 4 to 6 inchs.

Sheathing, decking and special spacing of rafters are not required.

Ease of handling slices installation time sharply.

Inventory costs are low. The material can be stored in little space and needed lengths cut from rolls.

The roofing comes in three gages, U. S. standard 26, 24 and 22. Lengths are 50, 100 and 200 feet, widths are 28 and 48 inches. Corrugations are spaced 1¼ or 2½ inches.

The Markets — Farm buildings are expected to be a prime target for the material. They've accounted for more than 4 billion pounds of the light metal since 1946. Industrial buildings, warehouses and garages are other likely prospects. Some 250,000 pounds of the new material have been tested on farm and industrial buildings.

Manufacturing techniques are protected by patents held by Ned A. Ochiltree, president, Ceco Steel Products Corp., Chicago. Quaker State Metals, headed by Raymond Buckwalter, has exclusive U. S. rights to apply the process to aluminum. QSM has already entered volume production with a new 54-inch rolling mill and additional corrugating machinery.

Crane Enters Mining Business

Crane Co., Chicago, has formed two mineral companies to operate deposits of rutile and ilmenite (titanium ores) and zirconium and monazite (containing radio-active thorium), J. L. Holloway, president, states.

Crane is building a $25-million plant in Chattanooga, Tenn., for the production of titanium sponge. Construction is near completion and officials of Cramet Inc., subsidiary operating the plant, say production may get under way before the year's end. Capacity goal for the plant by the end of 1955 is 6000 tons annually.

Titanium Gets New Boost

Western Pyromet leases West Coast plant, says it will make 6000 tons a year by 1956

AS MUCH TITANIUM sponge as the whole industry now produces—that's the goal of Western Pyromet Co.'s government-owned magnesium plant at Manteca, Calif. If all goes well, B. D. Hardin, president of the new company, thinks they'll hit the mark within two years.

Western Pyromet (its plant is 70 miles southeast of San Francisco) has a contract with GSA (General Services Administration) calling for the lease of the Manteca property for a 9-to-12-month pilot-plant stage. After the trial period, the company has an option on a 10-year lease.

No Immediate Remedy—Pilot operations will not be the immediate answer to the surplus-labor problems of the area. GSA discloses that initially Pyromet is renting only two of the four furnaces and 32 of the 232 retorts in the plant, plus some laboratory and office space. That means a small technical staff and work force. But Mr. Hardin estimates total employment of between 1000 and 1100 within two years—the date set for 6000-tons-a-year production.

That estimate of production is not excessive, Mr. Hardin believes, even though total U. S. production of titanium this year will be only about 6300 tons. Western Pyromet will use the Kroll process, buying raw materials on the open market. Mr. Hardin says the company has interests in the ilmenite field of Nevada but does not anticipate developing its claims for at least five years as long as there is plentiful supply on the open market at a reasonable price.

No Outside Help—The company will use its own funds to convert the $6-million plant and conduct the pilot operations. It's estimated that conversion will call for about one-fourth the cost of a new plant.

Babies: A Growing Impact

Outlook for more families in 1960s adds strength for continued high-level economy

PEOPLE are markets. And if that is true, the nation's economy isn't going to lose its high-level momentum for several years, indicates a survey by the U. S. Department of Health, Education & Welfare.

Enrollment in the nation's schools and colleges this fall will hit an estimated 38 million, the tenth consecutive yearly increase for the country's educational facilities. Education Commissioner S. M. Brownell also estimates that the enrollment peak is yet to come—46 million by 1959-60.

Expanding Impact—Significance of the statistics is the outlook for new family starts beginning in the early 1960s. Impact of the high war and postwar birth rates has been largely on construction and a few other industries. A speedup in the rate of family formations will cause that impact to rapidly fan out to the other segments of the nation's economy.

Commissioner Brownell states that while more schools are being built currently than in any other single period, the rate of construction will have to be tripled to keep pace with the growing numbers of children. He estimates that about 720,000 public elementary and high school classrooms and related facilities will be needed in the next five years.

IRS Starts on Tax Law Rules

Tentative rules showing the "how, when and where" of the new tax law requirements are being set up by the Internal Revenue Service.

First batch covering about 21 areas of the new law was published in the Aug. 27 Federal Register. Taxpayers may complain about an agency interpretation of the law within 30 days of publication. Such complaints, made in writing to the IRS, will be considered before final adoption of the new rules.

IRS reports that about 40 more areas of the law remain to be covered.

United Press

Republic Aircraft Moves an Acre of Engineers

Republic Aviation Corp. moved 370 aeronautical engineers and equipment into an acre of new office space at Farmingdale, L.I., from downtown Manhattan, a distance of 50 miles, without losing an hour of regular work time. The move was made to speed blueprinting of a new, top-secret jet fighter, the Republic F-105

'Weathermaster' Will Kick New Jersey Fog Around

F. A. THAHELD does something —besides talk—about the weather.

He has designed four "weathermaster" units to blow fog and smoke from vital spots on the New Jersey Turnpike—conditions that have caused serious accidents, and on occasion, even prompting officials to shut down the facility.

From Frost to Fog—As vice president and chief engineer of Diesel Power Inc., Greenville, Pa., Mr. Thaheld originally designed the "weathermaster" units to blow frost from California and Florida orange groves. But he felt they could be used on fog and smoke; tests also convinced New Jersey Turnpike officials.

The "weathermaster" is a 29-foot aluminum tower on top of which is a horizontally mounted propeller. An electric eye starts up or shuts off the 28-hp electric drive motor as the need arises.

How To Do It—Mr. Thaheld explains that the propeller runs at a speed of 1200 rpm and draws down over 1 million cubic feet of upper (and warmer) air per hour against a large saucer-like panel (the diffuser) on the tower. Some of the air goes down through an opening in the diffuser, attacking the fog and smoke and frost at ground level. The rest of the air is blown off the diffuser at about 35 miles an hour. The latter air so stirs up the fog that, together with the warmer air, it can quickly drive off the last wisp of mist.

Hubbard Aluminum Products Co., Pittsburgh, made the towers; other parts were produced and assembled at the Greenville, Pa., plant.

Appointments in Washington

John H. Spraggon, assistant to the manager, Steam Division, Westinghouse Electric Corp., is on loan to the government as director, Power Equipment Division, Business & Defense Services Administration.

R. G. Boyd, Chicago, Ill., on leave as assistant general sales manager, Kaiser Aluminum & Chemical Sales Inc., is an assistant administrator, Business & Defense Services Administration, Commerce department.

Fred M. Hauserman, president, E. F. Hauserman Co., Cleveland, maker of metal office partitioning, is president of the Building Research Institute, National Academy of Sciences-National Research Council. Edmund Claxton, director of research, Armstrong Cork Co., is vice president.

By E. C. KREUTZBERG Washington Editor

Odds Favor U.S. Approval of Proposed Steel Merger

CURRENT BELIEF in Washington is that the Justice department will give a green light to the proposed merger of Bethlehem Steel Corp. and Youngstown Sheet & Tube Co.

Questioned about this matter, Judge Stanley N. Barnes, head of the antitrust division, admitted the principals sought advance clearance from Justice, but he added, "no decision yet has been reached."

Tough Job — Judge Barnes told STEEL that weighing mergers is a complex matter requiring careful study of all factors. "In these days of diversification you can't set up universal criteria even for mergers in the same industry." The general rule is that a merger is "bad" under Section 7 of the Clayton Act when it tends to lessen competition; it is "good" when it tends to strengthen competition.

The Judge wouldn't say whether he thought the Bethlehem-Youngstown merger would be good or bad. Other observers in the Capitol think the move will be approved because Bethlehem's sales areas are largely in territories where Youngstown is not a competitor, and because Bethlehem's shipbuilding, fabricating and other nonsteelmaking activities are not duplicated by Youngstown.

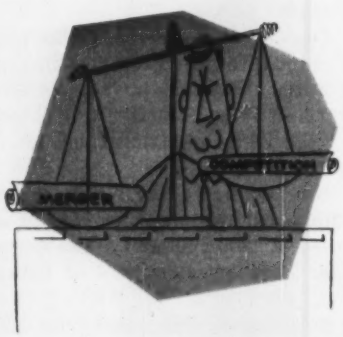
Approval Comes—Judge Barnes did say that Justice has given clearance to several mergers when principals called at the Justice department. The Packard-Studebaker action was given a clean bill of health because the resulting company will have a more complete line of products and will be a stronger competitor. Justice also has given advance clearance to the Hilton-Statler hotel merger.

Without disclosing identities, Judge Barnes said that some mergers originally opposed by Justice are given approval after merger terms are modified. One big merger that Justice opposed a year ago has been O.K.'d, following conversion of 50 per cent of the acquired company's stock into nonvoting stock.

Justice, FTC Overlap . . .

While both Justice and the Federal Trade Commission claim concurrent jurisdiction over the antimerger law (Section 7 of the Clayton Act), Justice has not brought any antimerger actions. But the FTC has brought three—against Pillsbury Mills Inc., Luria Bros. and Crown-Zellerbach Corp. In all three the charge is that the mergers, through the acquisition of competitors, have lessened competition. There have been no court decisions in any of those cases. In fact, the Pillsbury case is in the hearing stage, the Luria case is scheduled for hearings starting Sept. 21 and the Crown-Zellerbach case should go to hearings about the same time.

The Pillsbury case is specially interesting. The trial examiner had dismissed it. Then the commission reversed on finding enough evidence to make a "prima facie" case. The contention is that Pillsbury's acquisition of Ballard Co. and Duff's Baking Mix Division of American Home Products Corp. "may substantially lessen competition or tend to create a monopoly."



In the Pillsbury reversal, the commission made it clear that it was getting away entirely from judging antimerger charges on the old "per se" basis and under the old "substantiality" test. Instead, a "rule of reason" was applied. This calls for careful examination of all factors in the case to find "the probable economic consequences of corporate mergers and acquisitions." In particular, the commission admitted into the evidence in the Pillsbury case certain market surveys, which the trial examiner excluded in his decision to dismiss. These market surveys show what happened to market prices after merger.

Working Agreements . . .

In a recent question-and-answer session Chairman Edward F. Howrey of the FTC made it clear that the commission applies the same yardstick as the Justice department—a merger is bad or good as it lessens or strengthens competition. Questioned about the Kaiser-Willys consolidation, Chairman Howrey said the commission approves.

While FTC and Justice confer continually about mutual enforcement policies and procedures, they have only one agreement: When one of them takes up a case the other will not intrude. That, says Judge Barnes, is to "keep companies from shopping around" to see where they can get the best deal.

And there is this difference between Justice and FTC operation: FTC issues its own cease-and-desist and other orders; Justice relies on court orders and injunctions. Justice could stay a merger with an injunction. FTC could act only after the merger had been accomplished.

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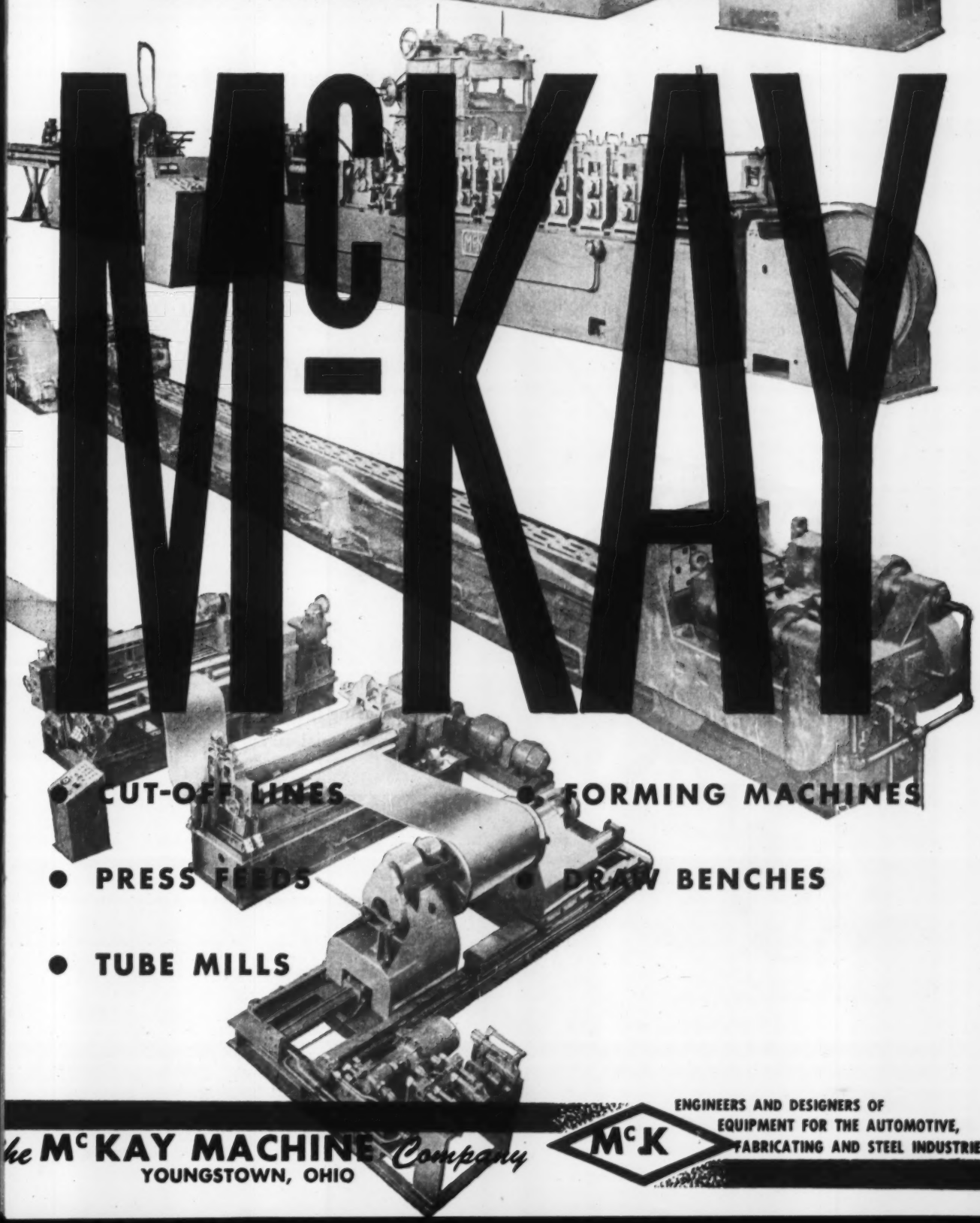

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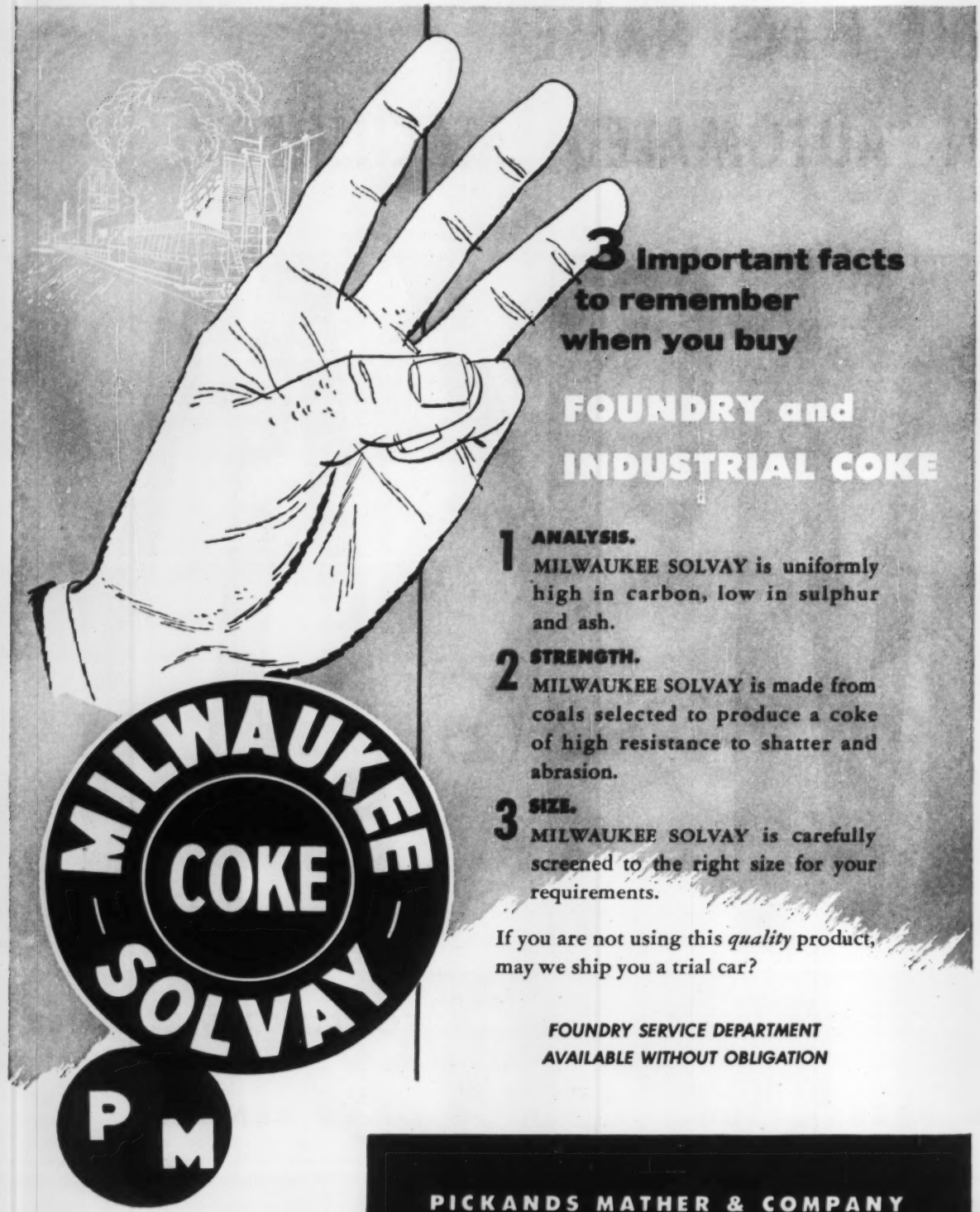

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No Sag in Military Spending Abroad

The peak may yet be ahead for spending by the military in foreign countries. Such spending amounted to $2.5 billion in 1953. Commercial trade benefits

EXPORTERS can count on U. S. military spending to bolster the supply of Yankee dollars on foreign shores at least another year.

That conclusion (based on an analysis of 1953 spending) comes from the Office of Business Economics, Commerce department. U. S. military expenditures abroad reached $2.5 billion in 1953 and "are likely to be somewhat larger in 1954 than in 1953 because of expanding transactions in Western Europe," the report states.

Three Streams — Headwaters for U. S. armed forces spending overseas fall into about three equal sources: Purchases by armed forces personnel out of their pay; purchases of supplies and equipment; and outlays for construction, repairs and services.

Spending for supplies and equipment—including offshore procurement—rose from $560 million in 1952 to about $870 million in 1953. Outlays for construction of airfields, naval facilities, troop housing and other installations rose by over $100 million to almost $800 million in 1953. (In this category, incidentally, the Bureau of Foreign Commerce says 18 new projects involving $1,250,000 in construction equipment are open to U. S. bidders under the competitive bidding procedure of the North Atlantic Treaty Organization (NATO). Information on these projects may be obtained from any Commerce department field office.)

High Water Marks—In toto, this spending amounted to more than $6 billion since mid-1950, $1.3 billion in 1951 and $2.0 billion in 1952, as well as the $2.5 billion in 1953. Last year, earnings from these sources accounted for 15 per cent of all foreign sales of goods and services to the U. S. and contributed greatly to the increase of over $2 billion in foreign gold and dollar reserves. These factors in turn have much to do with foreign spending for dollar goods.

Though offshore procurement and military expenditures for foreign installations will probably increase slightly this year, one thing to watch are shifts in geographical patterns of the spending. For example, offshore procurement is likely to rise in the Far East in 1954; NATO common-use construction program and other outlays in Western Europe are likely to increase in 1954 and compensate for possible declines in this spending elsewhere.

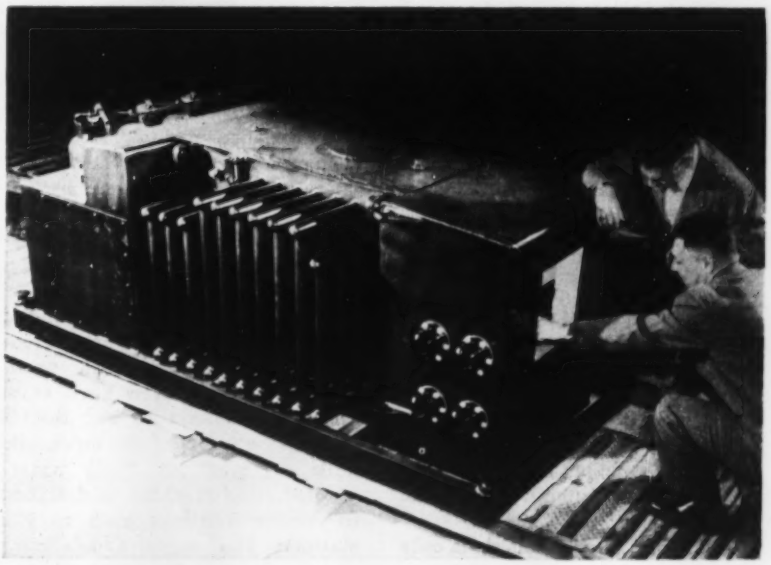
Slow Down in Spending

Foreign Operations Administrator Harold Stassen says U. S. military and economic aid appropriations for Europe for fiscal 1954 totaled $1.7 billion, compared with $4.2 billion in fiscal 1953. This cut has been possible because of Europe's economic progress, says Mr. Stassen.

Summing up the U. S. military aid program, he says this country has provided $9.4 billion of military items to free countries from October, 1949, through June 30, 1954. About 72 per cent of that aid went to Europe, 17 per cent to Asia and the Pacific area, 10 per cent to the Near East and Africa and about 1 per cent to Latin America.

Export Controls Eased

Secretary of Commerce Sinclair Weeks has announced policy decisions regarding U. S. security export controls "which relieve American exporters from many burdensome administrative restrictions on trade with friendly countries . . ." It's expected that this announcement will be followed by removal of more commodities from the Positive List of Commodities, published by the Bureau of Foreign Commerce. Exporters may then ship these deleted items to friendly countries without applying to the Commerce department for export licenses. It's hoped, too, that the list of goods embargoed from shipment from the U. S. to European Soviet Bloc countries may be shortened somewhat.



Load-Center for Argentina Tungsten Mines

General Electric Co.'s Distribution Transformer Department, Pittsfield, Mass., designed this unconventional 150-kva load-center for Sominar's tungsten mines at Los Condores, Argentina. Shown by the unit are design engineer Crawford Adams (right) and A. J. Carbonneau, who handled the building of the device

Vending Machines: Silent Selling Is Booming

NEA

AUTOMATIC merchandising sales, via 3 million vending machines, will hit about $1.8 billion this year—not bad for a business that started on peanuts.

Since their peanut-peddling debut, vending machines have grown constantly more complex and capable of handling a greater variety of products—aspirin to life insurance to bulk milk.

Big Sellers—Cigarette sales account for the largest number of vending machines. Nearly 500,000 units have annual dollar sales of about $685 million. Soft drinks and candy follow. About 20 per cent of all soft drinks, 20 per cent of all candy bars and 16 per cent of all cigarettes sold move through automatic vending machines, estimates the National Automatic Merchandising Association.

Automatic merchandising is only about a quarter-century old, employing upwards of 30,000 to 40,000 persons. About 125 companies make vending machines and parts, with the bulk being done by less than 12. Operating devices are electrical or manual—some use magnets.

Mechanical Milkman—An automatic milk machine has been successful since its introduction in 1950; it delivers a container of milk in one second, from half pint to one quart, making change in pennies and nickels. Ice cream sales by automatic vendor are approaching $18 million annually. Coffee and milk sales are increasing rapidly, with milk receiving a greater impetus the past year.

Emphasizing the continuing growth and diversity of the industry, Robert Z. Greene, president, Rowe Corp., New York, says, "Another addition to our line is an outdoor model of the automatic milk merchandiser. Fully waterproofed, this machine is designed to service locations such as gas stations, bus stops and similar places where milk has not been sold previously.

Railroad Buffet — "Our experiments with the Pennsylvania Railroad are still in progress. In December, 1953, we installed a battery of automatic food and beverage dispensing machines in a 'buffet-bar' car designed and equipped by the railroad specifically for this purpose. We will continue the use of the 'automatic buffet' on railroad trains to explore this market fully."

Coming trend is said to be completely automatic cafeterias, food and department stores and outdoor vending machines.

Color to Suit—A present trend is to streamline multiple machine installations for uniformity. One manufacturer is marketing an over-all housing that can be used to integrate a battery of varisized and varicolored machines. Some operators custom build these fronts to match the decor of a location.

The automatic merchandisers have to withstand rough treatment from the public. John Ericson, factory manager, Viking Tool & Machine Co., Belleville, N. J., comments that some machines need constant redesign to meet this going over and to safeguard the products distributed and the money collected.

The vending machine industry is a heavy user of steel, largely cold-rolled sheets and strip, enameling and electrocoated grades. Steel springs are used heavily, too. Cigarette machines in service account for about 60,000 tons of steel. The 11-column, electrically operated unit, which dispenses as many brands, weighs 325 pounds.

Hawaiian Firm Studies Can Plant

Hawaiian Pineapple Co. is seriously considering construction of its own plant to manufacture tin cans, according to Henry A. White, president.

"Proposals submitted to date by American Can Co. have fallen short of providing the savings our studies indicate to be possible from self-manufacture of cans," Mr. White told stockholders at an annual stockholders meeting in Honolulu.

If Hawaiian Pineapple proceeds with plans for its own can manufacture, the new can plant would be constructed next to its Honolulu cannery and would be in operation by early 1956, Mr. White said.

How Good Are Your Community Relations?

- Do you tell the world you are proud of your town and plant?

- Do you invite the people of the community in . . .

Jones & Laughlin Steel Corp.

Chase Brass & Copper Co.

- for an occasional open house or plant tour?

- Are you doing all you can to maintain a neat appearance?

John Volkert Metal Stampings Inc.

- Do you translate your doings into terms the community can appreciate?

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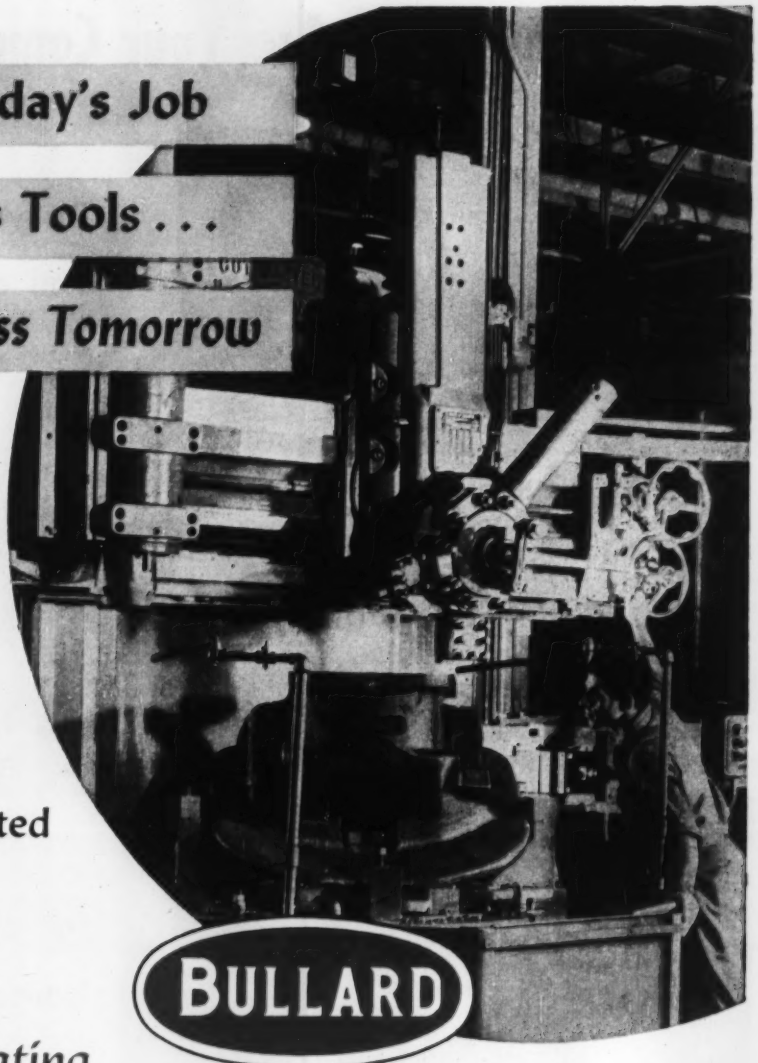

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tools have out-dated
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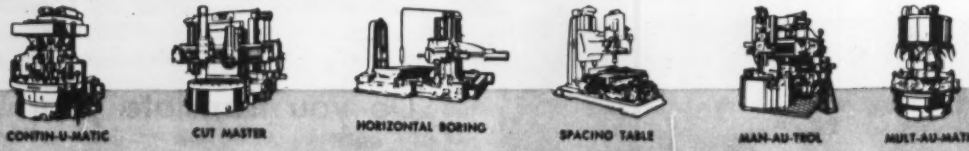

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When Detroit Stops 1954 Model Output, Here's How It's Done

STOPPING PRODUCTION at an auto plant probably impresses you as analogous to stopping a machine, if it impresses you at all.

To a certain extent, that's the case for short stoppages during the model run. But running out a model is another sort of proposition, something like trying to guess the length of individual strands in a kettle of spaghetti.

Fundamentals — To understand the basic problem, you have to get the idea of an auto plant as a place where about 7000 parts come together to form a line of cars. In the case of Plymouth Division of Chrysler Corp., items like different colored visor brackets carry different part numbers. With over 1 million legitimate combinations of parts, the number of illegitimate outcomes is too terrifying to contemplate.

To guard against this spectre, plants operate on what is essentially a production schedule based on anticipated consumer demand. Sales department statisticians know about how many cars will be ordered during the next few months. Of this number, past experience indicates about X per cent will be four-door sedans. Of the four-door sedans, about X per cent will be green. Of the green sedans, about X per cent will have solex glass, about X per cent will have power brakes, about X per cent will have squirrel tails, etc.

According to the Book—This bit of occult reasoning is compiled in a document colloquially referred to as "the book." On the basis of the book, orders are placed to suppliers, but, unfortunately, not to dealers. Chartreuse head liners may look good to the crystal-ballers. But, when cars being built to dealer order call for no chartreuse head liners, the plant may find itself with such items coming out its ears.

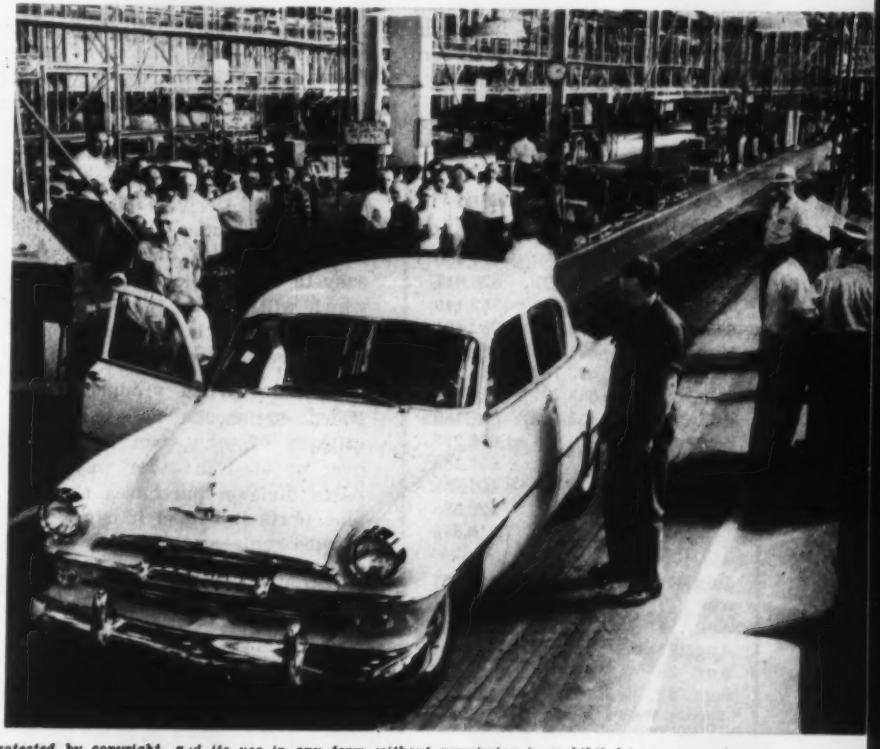
Although the book covers a period only six to eight weeks ahead and such boo-boos can be caught on the next edition, trim sets for example must be ordered 10 weeks or more in advance and Plymouth alone has 46 trim sets. That can mean one heck of a pile of chartreuse head liners before the miscalculation can be corrected.

Trouble Compounded—Add to that the fact that suppliers often overship, make mistakes in part numbers and include a percentage of scrap in their offerings and you begin to see the problem in making auto production end on the button like the wonderful one hoss shay.

To make things come out as even as possible, the auto company sets a target date on which the final car is to be built. This date is arrived at in two steps: First, it is decided when the new models should be introduced; and second, the length of time required for the longest item in the changeover is computed. Normally that is the body, as it is with Plymouth this year despite its new engine. In the case of Chrysler when the new V-8 was introduced, the engine controlled the change-over period.

Planning Job—When the termination of production date has been

Last 1954 Plymouth rolls off the line



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set, the plant which had been working ahead in effect begins working backward in its planning. This is known as "building out" and involves exact knowledge of the components needed to finish the run. The final month or so of production having been set by the sales department, the plant begins to determine which parts will be short through an elaborate system of inventorying. For in an auto plant, the inventory includes not only parts on overhead conveyors and in piles on the floor, but also parts on order and in transit.

Inventorying normally begins with trim items about ten weeks ahead of the final buildout since textile people work on the longest lead time. Many automakers today buy their woven material undyed, preferring to order colors when the score is more closely known. But despite that step, you'll be able to buy some mighty pretty drapes in a few months that originally were intended for auto interior duty.

Timing—As the inventory progresses and time grows shorter, the estimates of shortages become more precise. During the last couple of weeks the follow-up department is on the job from eight in the morning until after midnight checking and rechecking to be sure no shortages develop. For while a couple of extra trim sets might run only about $20, the shortage could hold up a car worth many times that. Follow-up figures the number on hand, the probable scrap and then allows a further margin.

But that margin must be kept as small as safety will permit, for there's nothing as useless as last year's auto parts. The parts supplying divisions have already been buying their own parts based on historical demand and have no use for a couple thousand extra chartreuse head liners. True, they'll take some of the popular parts on which they may have some order space, but the overages in production aren't figures in their business.

What To Do—If follow-up discovers a chartreuse head-liner situation in its initial inventory, several steps may be taken. Dealers may be approached and asked to push chartreuse head liners. If they respond that chartreuse head liners are simply dogs, the material may be redyed into aqua which sells. Or engineering may be called in to cite other uses for the material, perhaps pointing out that the firm will offer color-keyed polishing cloths the following year in which the material may be used.

The acuteness of the problem is heightened by the number of parts that will be obsoleted by the model change. In a face-lift, perhaps only 20 per cent of the parts will change. At Plymouth this year, about 99 per cent of the body parts will change, perhaps 60 per cent of the remainder. Even in the case of changes, some parts are easy to use up like nuts and bolts which will still do the job though they're an eighth of an inch longer than necessary, etc.

Solution—When production has ended, engineering makes its final critique of what can be carried over or used in other ways. The parts division purchases the surplus parts it thinks it can sell as service replacement items. Finally the clever boys come in who see textiles as drapes, plastic knobs as kiddie car accessories and hood ornaments as bicycle adornments. After that, the remainder is shoveled out into an obsolete inventory warehouse, a less painful disposal than outright junking which it probably will ultimately prove to be.

That essentially is the picture of what it takes to stop auto production though just a hint of the complexity of the paperwork involved is given. Also omitted are the occasional inventory takers who feel they can guess close enough and create shortages which must be filled overnight.

The Supplier View—That's the part the supplier often sees. In one case not involving Plymouth, a supplier reports he was asked for 400 of one item and 500 of another item in textiles overnight. Suppliers during this last few weeks often have run out their orders and pulled tooling preparatory to doing some changeover themselves. The headaches these boys undergo when somebody wants something in a hurry are king-sized without filters. For that reason the wise supplier usually does a little inventorying of his own, stocking an extra margin which he probably will have to eat. The reasoning: A supplier who keeps his client out of trouble probably will be remembered when contracts are awarded in the future.

Plymouth can be proud of the job it did this year. Five weeks ahead of the target date, the division estimated it would build its last car at 2 p.m. August 13. At 2:18, the beige four-door sedan pictured on p. 63 rolled off the final line, the last body on the last chassis. In tapering out production, the output had been shifted from two assembly lines to one, which, coupled with the normal occasional work stoppage in summer, makes the accuracy of the forecast phenomenal.

Time Schedule—The stampings for the last body were made 12 days before production stopped. The last body was assembled eight days ahead. The last fenders were finished 12 hours ahead. As the components for the last car move past each station, the worker is automatically laid off.

Beginning production will be the reverse of the process. But that's another story that we'll consider in about a month when we do "Production Begins Again at Plymouth."

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,249	684,843
June	623,732	713,778
July	543,797†	756,592
August	435,500†	641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,816,843

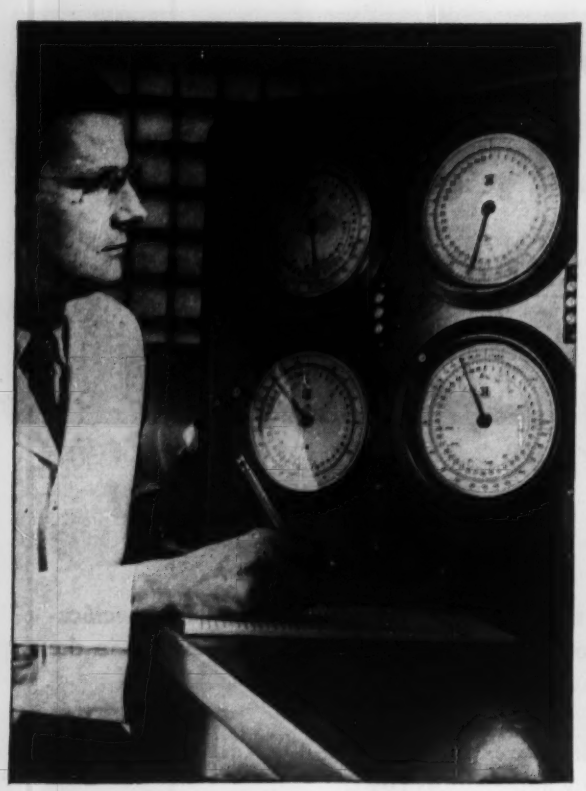
Week Ended	1954	1953
July 31	130,917	168,267
Aug. 7	124,168	137,671
Aug. 14	119,208	156,526
Aug. 21	121,736	163,635
Aug. 28	113,169	152,866
Sept. 4	103,000*	132,574

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

DO YOU HAVE ANY QUESTIONS ABOUT LEAD-TREATED STEELS?

QUESTION	ANSWER
What is a lead-treated alloy steel ?	It is an alloy steel made to any standard specification but with the addition of lead, usually in the range of 0.15—0.35%.
What special advantages does the lead addition impart to the alloy steel . . . . . ?	It improves the machinability, increases productivity and reduces costs.
In what qualities and forms are lead-treated alloy steels available ?	Any Aristoloy steel can be made with a lead addition and supplied in any of our standard sections.
Does the lead addition influence in any way the heat treatment of alloy steels . . . . . ?	No. A lead-treated alloy steel responds to heat treatment in exactly the same way as its counterpart without lead.
Does the lead addition affect the mechanical properties of alloy steels . . . . . ?	The addition of lead to any steel does not materially affect its mechanical properties.
What are the machining properties of a lead-treated alloy steel. ?	Lead-treated Aristoloy steels cut more freely than standard alloy steels, and yield a better surface finish even at higher cutting speeds. Of equal, if not greater, importance is the fact that these steels are less severe on the cutting tools.
ARISTOLOY STEELS Where are lead-treated alloy steels most suitably applied ?	Lead-treated Aristoloy steels show to greatest advantage when subjected to complicated or extensive machining operations, or *where it is necessary to machine in the higher ranges of tensile strengths.*

COPPERWELD STEEL COMPANY (Steel Division) **WARREN, OHIO**



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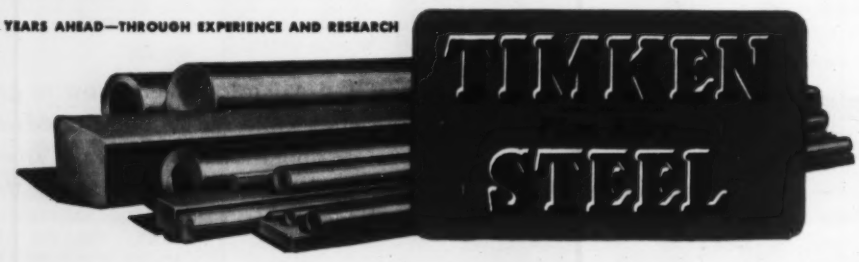
THE man on the left helps assure you of uniform composition in every Timken® steel forging bar. With this spectrometer, he can tell the exact composition of a melt in just 40 seconds. Results are flashed back to the furnace so the melter can maintain constant control of the heat analysis up to the instant of pouring.

The photomicrograph at right shows the uniform grain size of the Timken forging steels. Uniform grain size after heat treatment is assured by spectrometric or microscopic examination of every heat. The result—you can be sure that forgings made from Timken forging steels have uniformly high ductility and resistance to impact.

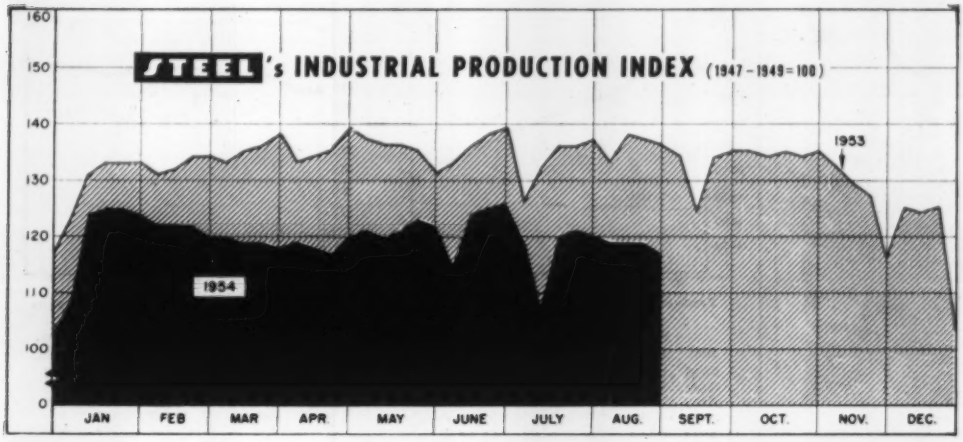
But that's only part of the story. You can hold rejects to a minimum because we condition the steel to fit your particular forging requirements. And you save steel because the good dimensional tolerances of Timken forging steels produce uniform weight multiples with a minimum of steel lost in flashings. You even have fewer furnace adjustments because Timken forging steels respond uniformly to heat treatment.

For help in improving the quality of your forgings and cutting production costs, write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



* Week ended Aug. 28.

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

October Outlook: More Signs of an Upturn

LOOK FOR over-all business activity to remain at about present levels through September. The reasons: 1. Extensive auto changeover will act as an anchor offsetting gains in other industries. 2. That old chestnut, inventory adjustment, is still hanging around. 3. Fast delivery and easy availability of material are acting against inventory build-ups.

But the worst is over as far as employment is concerned. Resurgent industries will offset auto industry layoffs; other seasonal ups and downs will cancel each other out, keeping employment around 62 million. October should show a strong pickup, with unemployment sliding under 3 million for the first time this year.

Morale Boosters—Here are some of the encouraging signs: In durable goods industries, the usual summer dip in employment failed to appear. The over-all factory hiring rate declined only seasonally. In fact, there was a smaller than usual dip in the primary metals, transportation equipment and instrument manufacturing industries.

Current employment sore spots are the railroad and mining industries, and little improvement is expected. Federal employment is also going down, but state and local governments are more than taking up the slack.

Against the Trend—An indication of strength in durable goods industries is the increase in average weekly earnings of its workers the past year. This was at a time when the average for all workers dropped from $71.33 to $70.92, according to the National Industrial Conference Board's figures.

Further indications of a coming uptrend is reported by the National Association of Purchasing Agents. Their survey shows definite pickups in production and new orders. A year ago, a substantial

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,544	1,515	2,140
Electric Power Distributed (million kwhr)	8,925[1]	9,207	8,540
Bitum. Coal Output (daily av.—1000 tons)	7,550	7,760	9,531
Petroleum Production (daily av.—1000 bbl)	6,180[1]	6,156	6,621
Construction Volume (ENR—millions)	$224.2	$258.9	$259.0
Automobile, Truck Output (Ward's—units)	113,169	121,736	152,866
TRADE			
Freight Car Loadings (unit—1000 cars)	680[1]	679	818
Business Failures (Dun & Bradstreet, no.)	228[1]	246	182
Currency in Circulation (millions)[3]	$29,786	$29,866	$30,105
Dept. Store Sales (changes from year ago)[3]	0%	+2%	0%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,395	$19,029	$15,733
Federal Gross Debt (billions)	$274.7	$274.7	$273.0
Bond Volume, NYSE (millions)	$15.0	$16.8	$10.6
Stocks Sales, NYSE (thousands of shares)	10,112	12,473	6,210
Loans and Investments (billions)[4]	$82.9	$83.3	$79.3
U. S. Gov't. Obligations Held (billions)[4]	$36.2	$36.4	$32.1
PRICES			
STEEL's Finished Steel Price Index[5]	194.19	194.19	189.38
STEEL's Nonferrous Metal Price Index[6]	214.7	215.1	207.6
All Commodities[7]	110.0	110.3	110.7
Commodities Other Than Farm & Foods[7]	114.4	114.3	114.7

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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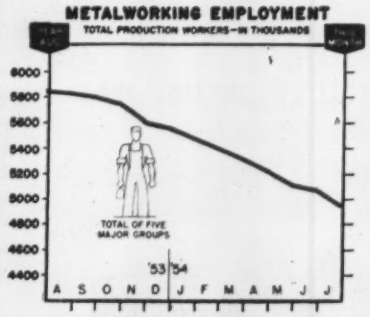
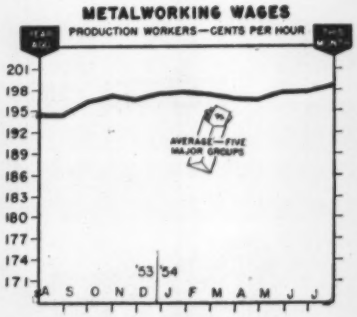
THE BUSINESS TREND



Production Workers—Five Major Groups in Thousands

1953	Prim. Mtls.	Fab. Prod.	Mach. Inery	Elec. Mchy.	Trans. Equip.
July	1,143	934	1,295	918	1,559
Aug.	1,138	942	1,268	932	1,547
Sept.	1,129	939	1,262	941	1,520
Oct.	1,112	924	1,254	933	1,507
Nov.	1,088	902	1,240	913	1,449
Dec.	1,074	875	1,238	883	1,487
1954					
Jan.	1,049	874	1,230	855	1,470
Feb.	1,027	864	1,220	839	1,435
Mar.	1,010	852	1,202	827	1,409
Apr.	991	840	1,187	811	1,380
May	976	833	1,165	791	1,342
June*	985	830	1,150	778	1,321
July*	968	802	1,122	775	1,266

*Preliminary.
U. S. Bureau of Labor Statistics.
Charts Copyright 1954 STEEL.



Production Workers—Five Major Groups (cents per hour)

1953	Prim. Mtls.	Fab. Prod.	Mach. Inery	Elec. Mchy.	Trans. Equip.
July	209	185	195	176	207
Aug.	208	185	196	177	206
Sept.	212	186	198	178	207
Oct.	208	187	199	177	209
Nov.	208	187	199	179	210
Dec.	208	188	200	180	211
1954					
Jan.	208	189	200	180	212
Feb.	208	189	200	180	212
Mar.	206	188	200	180	211
Apr.	206	188	200	180	211
May	206	189	201	181	211
June*	208	189	200	181	211
July*	211	189	201	182	212

*Preliminary.
U. S. Bureau of Labor Statistics.

lowering of activity already had been noted. So while this year's increases aren't large they are encouraging.

Signposts — The association names as indicators of improvement the strength shown in the industrial materials price structure, the improved inventory position, a slight stretch in buying policy and the strong construction activity. Recent strikes were the only "clouds" noted. "No boom but no bust" is their prediction for the rest of the year.

In Coming Months — The PAs see it this way: A further slow-up in inventory slicing, but short lead time will tend to discourage much build-up.

Buying policy remains 60 days and under, but there are the beginnings of a trend toward the high side, even some movement into the over-90-day column. Reduced inventories, price strength and increasing production are given as the reasons.

Gears and Structurals Rise . . .

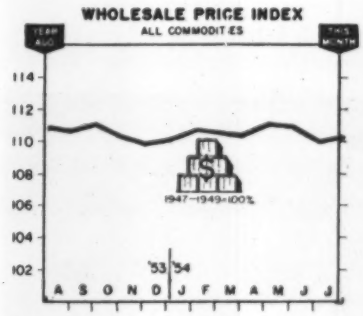
Two more segments of the economy climbed on the comeback trail during July. American Gear Manufacturers Association index shows the gearing industry volume rose 10.9 per cent from the June level. The July index was 141.3 (1947-1949=100). This is the highest since April and is well above the 120.7 of a year ago. The industry should hold on to the gain.

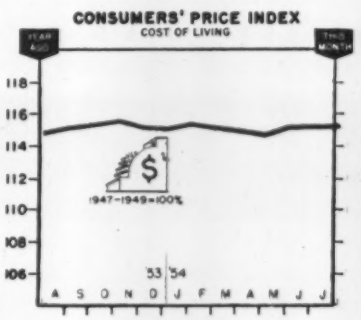
Fabricated structural steel had its best month since February. Bookings hit 259,342 tons, according to American Institute of Steel Construction. This is 18 per cent over June and about 39,000 tons over July, 1953.

A seasonal dip pushed shipments down to 243,824 tons, off 16 per cent from June but still 6 per cent over July of last year. Reflecting generally lower bookings and higher shipments in 1954, the backlog for the industry stands at 1,429,061 tons, compared to 2,133,517 tons a year ago.

Detroit Changes Over . . .

The auto industry will record its lowest September since 1946 with only 282,500 units programmed, according to *Ward's Automotive Reports*. That's 35 per cent under the estimate of 435,500 for August and, except for strike-bound July and August,





	1954	1953	1952
Jan.	110.9	109.9	113.0
Feb.	110.5	109.6	112.6
Mar.	110.5	110.0	112.3
Apr.	111.0	109.4	111.8
May	110.9	109.8	111.6
June	110.0	109.5	111.3
July	110.4	110.9	111.8
Aug.	....	110.6	112.2
Sept.	....	111.0	111.7
Oct.	....	110.2	111.1
Nov.	....	109.8	110.7
Dec.	....	110.1	109.6

U. S. Bureau of Labor Statistics.

	1954	1953	1952
Jan.	115.2	113.9	113.1
Feb.	115.0	113.4	112.4
Mar.	114.8	113.6	112.4
Apr.	114.6	113.7	112.9
May	115.0	114.0	113.0
June	115.1	114.5	113.4
July	115.2	114.7	114.1
Aug.	....	115.0	114.3
Sept.	....	115.2	114.1
Oct.	....	115.4	114.2
Nov.	....	115.0	114.3
Dec.	....	114.9	114.1

U. S. Bureau of Labor Statistics.

1952, the lowest production in 32 months.

Changeover at Chevrolet, Pontiac and Chrysler Corp. divisions will account for most of the decline. Trimming at Ford, the Packard shutdown and one less working day in the month will also cut into output. On the other hand, Studebaker, Kaiser, Willys and Mercury are hoping to build more cars in September than they did in August.

Studebaker announced Sept. 7 as starting day for its 1955 run. Chrysler divisions will get under way around Sept. 15 with a goal of 8000 cars for the month and with an all-out effort set for October and November.

Moving Day at Packard . . .

Packard's shutdown will begin Sept. 10 for about 60 days. During the shutdown, final assembly operations will be transferred to the plant recently leased from Chrysler. About 3000 of the firm's 9000 employees will be idled at various times during the operations. Retooling will be done at the same time with production beginning in early November.

Ward's sees a possible return in employment to about the 1954 peak of 676,800 hit in January. In July, industry figures put hourly-rated employment at around 550,000. Last year it was 779,000.

Unemployment in the motor city is expected to hit a high in the last week of September or the first week in October with as many as 100,000 filing jobless claims.

Trends Fore and Aft . . .

Finally, some good news for the railroads: Dun & Bradstreet says a group of New York security analysts estimates that for the rest of the year freight car loadings will rise to nearer year-ago levels. . . . Electrical output set another record, 9207 million kilowatt-hours for the week ended Aug. 21. . . . Construction ran into a seasonal snag. Awards for the week ended Aug. 26 were down to $224 million, but this was still good enough to make the second-best August on record, according to *Engineering News-Record*. . . . New business incorporations are increasing. The July total of 9409 is highest for that month since 1946. New businesses chartered in the first 7 months of 1954 total 67,299, highest for the period since 1947.

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. . . Colson v. p. and sales director

ROBERT W. BOWLES
. . . Kaiser mgr., specialty steel sales

PETER ROBERTSON
. . . Republic Steel vice president

Edward C. Hamm was made vice president and director of sales of **Colson Corp.**, Elyria, O. Since 1946 he has been president and general manager, Service Caster & Truck Corp., assets of which were acquired by Colson last May.

Ralph R. Butler was elected to the newly created post of executive vice president, **Unistrut Products Co.**, Chicago. He was president of the firm's eastern sales division with headquarters in Chicago.

At **Louis Allis Co.**, Milwaukee, **Hans M. Larsen** fills the newly created post of director of purchases and production planning.

Vaughn Machinery Co., Cuyahoga Falls, O., appointed **Maurice A. Nye** chief engineer and **James E. Spearman** assistant to the president. **Dale R. Knouse**, formerly with Aluminum Co. of America, has joined the sales engineering staff.

Fellows Gear Shaper Co., Springfield, Vt., appointed **Bernard L. Ward** assistant chief engineer, **Henry G. Stone** chief of tool design with **Carl H. Parker** as assistant, and **J. L. Williamson** chief of research with **Roland Seavey** as assistant.

James F. McLaughlin was appointed general manager, **Triangle Steel & Supply Co.**, Vernon, Calif.

Robert W. Bowles was made manager, specialty steel sales, **Kaiser Steel Corp.** With offices at Oakland, Calif., he will direct sales of pipe for fence posts, gusset plates and other specialty steel products.

Howard Jackson was promoted to vice president in charge of production at the Pittsburgh and Chicago plants of **Hubbard & Co.**, Pittsburgh. He formerly headed production at the Chicago plant. **Charles S. Kernaghan** was elected vice president in charge of merchandising and assistant to the president. **Richard G. Robbins** was made vice president and general sales manager of the Pittsburgh and Chicago plants covering the eastern and mid-western territories. **Alton R. Smith** was made works manager and **John Winke** assistant works manager at Chicago.

George W. Benbury was promoted to assistant general purchasing agent, **Pennsylvania Salt Mfg. Co.**, Philadelphia. He will direct activities of the construction equipment and containers sections.

Donald C. Buxton was elected president, **Buxton Machine & Tool Co. Inc.**, Buffalo, to succeed his father, the late **Clarence B. Buxton. Arthur R. Buxton** was elected vice president. **Virginia B. Kester** is secretary-treasurer.

Peter Robertson was named vice president in charge of planning and development of **Republic Steel Corp.**, Cleveland, to succeed **E. M. Richards**, retiring. **Charles P. McCabe**, formerly manager of Republic's Bolt & Nut Division, succeeds Mr. Robertson as assistant vice president in charge of operations of manufacturing plants. **John Dunlop** replaces Mr. McCabe.

Thomas Poirier was made assistant to the president, **Chrysler Division**, Chrysler Corp., Detroit. He had been chief of production research since 1951.

Promotions at **Mueller Brass Co.**, Port Huron, Mich., include **Robert L. Gibbs** as assistant general sales manager, **Elbert A. Fairchild** as assistant to the general sales manager, **Paul L. Craft** as manager, industrial division, **Charles R. Black** as manager, wholesale distributing division and **Richard S. Thompson** as assistant to Mr. Black.

Brooks McCormick, managing director of International Harvester Co. of Great Britain Ltd. for the last two years, has returned to Chicago as director of manufacturing of **International Harvester Co.**, parent corporation.

James P. Cooper was made general superintendent in charge of manufacturing at the West avenue and

KENNETH P. MARTIN
. . . National Automatic Tool gen. sales mgr.

STEPHEN L. INGERSOLL
. . . exec. v. p. of Ingersoll Steel

JOSEPH E. SMITH JR.
. . . Bryant Chucking Grinder div. mgr.

Genesee plants of **General Railway Signal Co.**, Rochester, N. Y.

Kenneth P. Martin was appointed general sales manager, **National Automatic Tool Co. Inc.**, Richmond, Ind. He formerly served Cincinnati Milling Machine Co. as sales manager, process machinery division.

Edward H. Heath was made manager of quality control at **Howell Electric Motors Co.**, Howell, Mich. He formerly served Marathon Electric Corp. as chief engineer.

A. W. Morgan, formerly executive vice president and general manager of Pachmayr Gun Works Inc., joined **Convair Division**, San Diego, Calif., General Dynamics Corp., as assistant to the manager.

New vice presidents of **Veeder-Root Inc.**, Hartford, Conn., include **Keith D. Graham**, production control superintendent, **Andrew J. Rebmann**, secretary and assistant treasurer, and **Leon J. Dunn**, assistant to the president.

At **Ingersoll Steel Division**, Borg-Warner Corp., New Castle, Ind., **Stephen L. Ingersoll** was promoted to executive vice president. He previously was vice president and treasurer. Other promotions include **Harold G. Ingersoll Jr.** as vice president and secretary, **Ralph W. Leigh** as vice president of sales and **William C. Zepf** as treasurer.

James D. Fraser joined the foundry sales department of **C. O. Bartlett & Snow Co.**, Cleveland. He was associated with the Chicago works of National Malleable & Steel Castings Co.

Deane B. Crawford retires from **Cleveland Cap Screw Co.**, Cleveland, where he served as sales manager, standard products division.

Bryant Chucking Grinder Co., Springfield, Vt., appointed **Joseph E. Smith Jr.** manager of its gage and spindle division to co-ordinate sales, engineering and manufacturing of its gage product line and rotational equipment for special industrial applications.

Clifford R. Boeckler was made manager of a new sales office at Buffalo which will serve the western New York territory for **Niagara Machine & Tool Works.**

William B. Hilbert was made production manager of the Endicott, N. Y., plant of **International Business Machines Corp.** He succeeds **Charles A. Cullen**, recently appointed general manager of a new plant under construction at Kingston, N. Y.

Newly created vice presidencies at **Thompson Products Inc.**, Cleveland, are filled by **E. P. Riley** and **Charles W. Ohly.** Mr. Riley, formerly manager of the accessories division of the Tapco plant, is now in charge of three of the company's operating divisions, the accessories and turbine drive divisions at Tapco and the commercial pump division at the Cleveland main plant on Clarkwood road. Mr. Ohly was made general manager of Thompson's Michigan operations. **Pierce T. Angell** succeeds Mr. Riley, **John B. Gates** was named manager, commercial pump division and **W. P. Bente** will manage a new operation at Tapco, tentatively designated as the turbine drive division. **Matt P. Graham**, who has headed Thompson's Michigan operations since 1929, continues as a vice president of the company.

Allen H. Ottman was elected executive vice president, **Rochester Mfg. Co.**, Rochester, N. Y. He also was made general manager and a director.

Clinton D. St. Clair was elected vice president and general manager, **Chisholm-Ryder Co.**, Niagara Falls, N. Y., subsidiary of Niagara Frontier Industries Inc.

Charles A. Kuhnmuench was made manager of sales for the Pittsburgh-Cleveland area of **Trent Tube Co.**, with headquarters at Pittsburgh.

L. C. Schweitzer, former Chicago district manager of **Ohio Crankshaft Co.'s** TOCCO Division, was appointed assistant general manager of that division.

R. M. Hollingshead Corp., Camden, N. J., appointed **Maurice F. Roche** western regional manager for its automotive sales division. He will have headquarters at Hollingshead's new chemical plant at

Delpark FILTRATION

AT

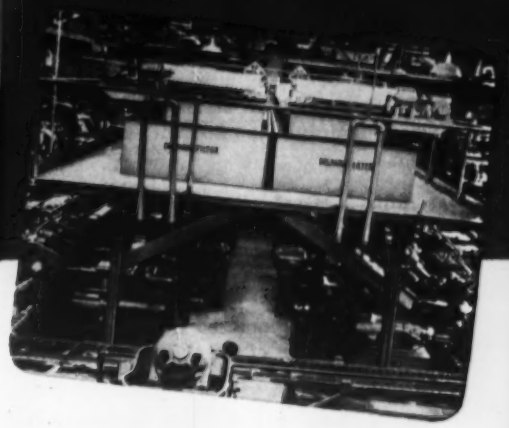
PRATT & WHITNEY AIRCRAFT

(DIVISION OF UNITED AIRCRAFT CORPORATION)

filters Aluminum Chips from Cutting Oil

Close up at DELPARK sump filtering cutting oils from a battery of automatic Fayolbert Machines.

Illustration below shows same DELPARK installation in its position above the machines being served.



There are thousands of DELPARK Filters in industry today and the reasons for their acceptance are simple. The savings in maintenance labor alone is enormous yet other savings in reduced rejections, extended coolant and tool life and reduced machine parts replacements add up to even greater savings. Here is one part of production where costs can be materially reduced without retooling for design changes. Here, with DELPARK filtration, greater efficiency of men and machines can produce better products at less cost with greater accuracy.

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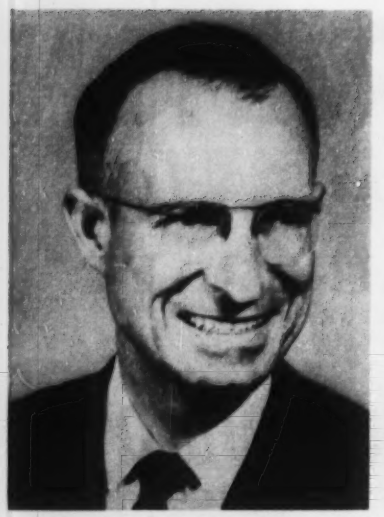

RANALD M. GARRISON
. . . manager of manufacturing at H-VW-M

JACK E. HEUSER
. . . sales v. p. at Le Roi Co.

R. W. CRAWFORD
. . . promoted by Lombard Corp.

Sunnyvale, Calif., when it is completed. His temporary headquarters are at San Francisco.

Ranald M. Garrison was appointed manufacturing manager, **Hanson-Van Winkle-Munning Co.**, Matawan, N. J.

Sutton Engineering Co., Bellefonte, Pa., appointed **Walter F. Larson** chief engineer and **Donald E. Russell** sales manager of its new hydraulic equipment department.

Julius E. Graf will retire Oct. 1 as chief engineer of **Jones & Laughlin Steel Corp.**, Pittsburgh.

Sintercast Corp. of America, Yonkers, N. Y., appointed **Robert Harrison** director of special engineering projects.

R. K. Hill was elected assistant treasurer and **D. F. Stair** assistant secretary, **Dayton Malleable Iron Co.**, Dayton, O.

Le Roi Co., Milwaukee, appointed **Jack E. Heuser** vice president-sales with responsibility for organization and management of a newly created sales division which will sell and service all Le Roi products. He had been engine division sales manager.

Thomas S. Nolan was elected executive vice president, **Edwards Co. Inc.**, Norwalk, Conn. **Eugene P. Werner** was elected treasurer and secretary and also made a director.

James T. Karabasz, formerly regional sales representative of Joseph T. Ryerson & Son Inc., was appointed general manager, **Luria Steel Supply Co. Inc.**, Bethlehem, Pa.

Morgan Engineering Co., Alliance, O., announces retirement of **Arthur T. Davis** as vice president and director of sales. He was with the company 42 years and continues in an advisory capacity.

R. W. Crawford was promoted to manager of machinery sales and sales promotion of **Lombard Corp.**, Youngstown.

Thomas O. Carson, manager at New York for **Rockwell Mfg. Co.'s** international division, moves to Pittsburgh as assistant product manager for Nordstrom valves.

Louis E. Schumacher was appointed assistant sales manager, Plains Division, **Caterpillar Tractor Co.**, Peoria, Ill. He succeeds **L. L. Morgan**, named manager, sales development division.

Walter A. Erickson was made superintendent of assembly at the Camera Works plant of **Eastman Kodak Co.**, Rochester, N. Y. **Francis J. Haas** and **Thomas R. Allen** were appointed assistant superintendents.

John L. Rowe was made plant manager of **Continental Can Co.'s** Los Angeles plant.

OBITUARIES . . .

L. L. Willfong, 75, who retired a year ago as vice president and general manager, forge division, **Earle M. Jorgenson Co.**, Los Angeles, died Aug. 17.

William A. Prentiss, 100, retired president, **George W. Prentiss & Co.**, Holyoke, Mass., died Aug. 23.

Winthrop K. Howe Sr., adviser and former vice president, **General Railway Signal Co.**, Rochester, N. Y., died Aug. 20.

Victor F. Rea, president and founder, **Rea Magnet Wire Co. Inc.**, Ft. Wayne, Ind., died Aug. 21.

Joseph Roth, 45, president, **Electroweld Mfg. Co. Inc.**, Chicago, died Aug. 16.

E. B. Huesmann, manager of the tin plate department at **National Can Corp.**, Chicago, died Aug. 15.

William C. Samuel, 61, secretary-treasurer, **Alpha Engineering & Machine Works Inc.**, Chicago, died Aug. 18.

Harry S. Malone, 63, former production manager, **Delco Division**, General Motors Corp., Dayton, O., died Aug. 17.

CLAYMONT FLANGED AND DISHED HEADS

from 9 inches

to 19 feet in diameter

Flanged and dished heads made by Claymont are available in sizes from as small as 9 inches to as large as 19 feet in overall diameter; and in gauges from 3/16-inch to 6 inches. They can be supplied in carbon steel, alloy steel or with stainless steel cladding.

All carbon and alloy steels are the product of our own open hearth furnaces—closely and completely controlled to meet customers' specifications.

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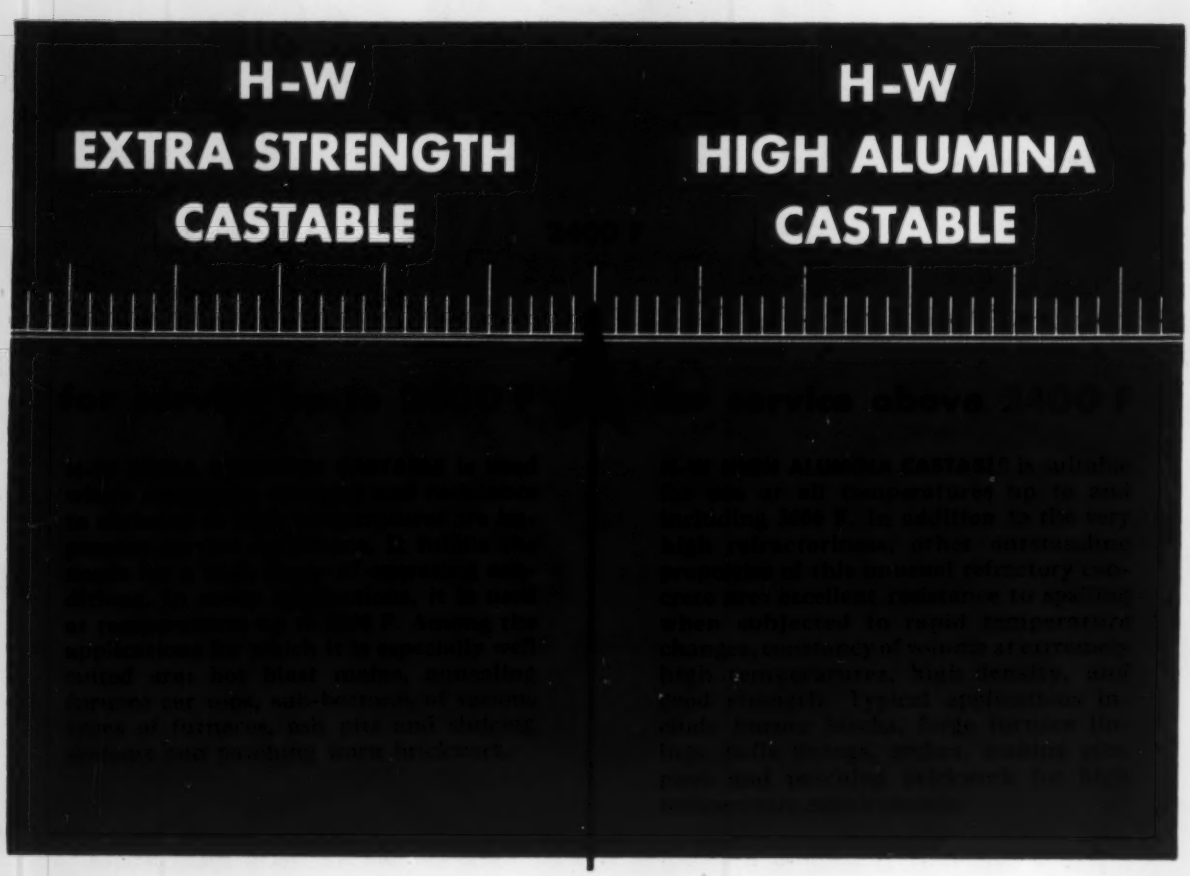
to serve you better . . .

for a wide range of operating conditions



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Harbison-Walker castable refractories are available in all the various classes, having the most desirable combinations of properties for particular requirements, such as adequate refractoriness, strength, insulating value, resistance to thermal shock and the corrosive action of slags and fluxes.

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Weirton Finishes Project

Firm builds another blast furnace turboblower and extends open-hearth mixer building

CONSTRUCTION is finished on a blast furnace turboblower and an extension to the open-hearth mixer building at Weirton Steel Co.'s Weirton, W. Va., mill.

The new No. 6 turboblower, a duplicate of the No. 5 unit, has a high-pressure steam turbine that blows hot air at 90,000 cfm. The 11,000-hp turbine (speed, 2660 rpm) is 12 x 35 ft and stands about 12 ft high, say officials of Weirton, a division of National Steel Corp., Pittsburgh.

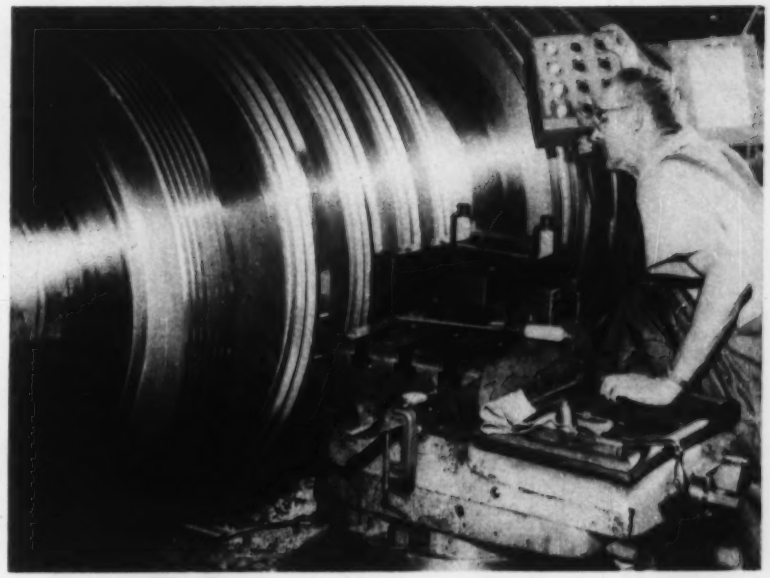
Reserve Unit—Air from the new turboblower and the other five units is blown into the blast furnaces and bessemer converters. The company's four blast furnaces and two bessemers are the equivalent of five furnaces. With six turboblowers, there is one extra blower unit that can be put into use if one of the five is down.

The structural steel extension of the open-hearth mixer building is 104 ft long, making a total mixer building length of 318 ft. The older section houses two bessemer converters and a hot-metal mixer, while the new section provides space for a future converter.

A new 150-ton-capacity crane in the extension supplements a 100-ton crane that has been in operation at the open hearth. The new crane, with a span of 79 ft 4 in., will work the entire length of the mixer building, except for the section at No. 1 converter. It will be worked by the smaller crane. Two 125-ton girders, measuring 104 ft in length, form the runway for the new crane.

Machine Tool Firm Expanding

Peck, Stow & Wilcox Co., Southington, Conn., is expanding its Machine Tool Division. Its sheet-metalworking line will be diversified and a new line of industrial equipment will be added. Plans to transfer the Hardware Hand Tool Division to Hartford, Conn., are under way. Surplus equipment in this division will be disposed of to give machinery departments room to grow.



GE Machinist Cuts Dovetail Grooves in 18-ton Rotor

A machinist in General Electric Co.'s turbine factory at Schenectady, N. Y., watches carefully as dovetail grooves are cut in the slowly rotating 18-ton rotor. It is part of a 156,250-kw steam turbine-generator that will be installed in the San Fernando valley steam plant of the Los Angeles city power system

Follansbee Opens New Depot

Follansbee Metals, division of Follansbee Steel Corp., Pittsburgh, is serving its New England customers from its new depot in Wallingford, Conn. Regional headquarters at Fairfield, Conn., have been closed. The new facility is handling hot and cold-rolled steel products, terne metal and sheet metal specialties.

Offers Titanium Fasteners

Camcar Screw & Mfg. Corp., Rockford, Ill., producer of precision cold-formed parts, is ready to supply standard and special titanium fasteners in production quantities. The material is RC-130B, a special wire composed of 92 per cent titanium, 4 per cent aluminum and 4 per cent manganese. It withstands temperatures up to 800° F and weighs about 44 per cent less than alloy steels of corresponding strength.

Townsend Buys West Coast Firm

Townsend Co., New Brighton, Pa., purchased West Coast Tool & Supply Co., Los Angeles. West Coast makes flexible ejection chutes used in weapons for aircraft and armored ground vehicles. Townsend, a maker of fasteners, rivets and cold-headed parts, will operate the new facility as a wholly owned subsidiary. Some manufacturing operations will be consolidated at its Santa Ana, Calif., plant.

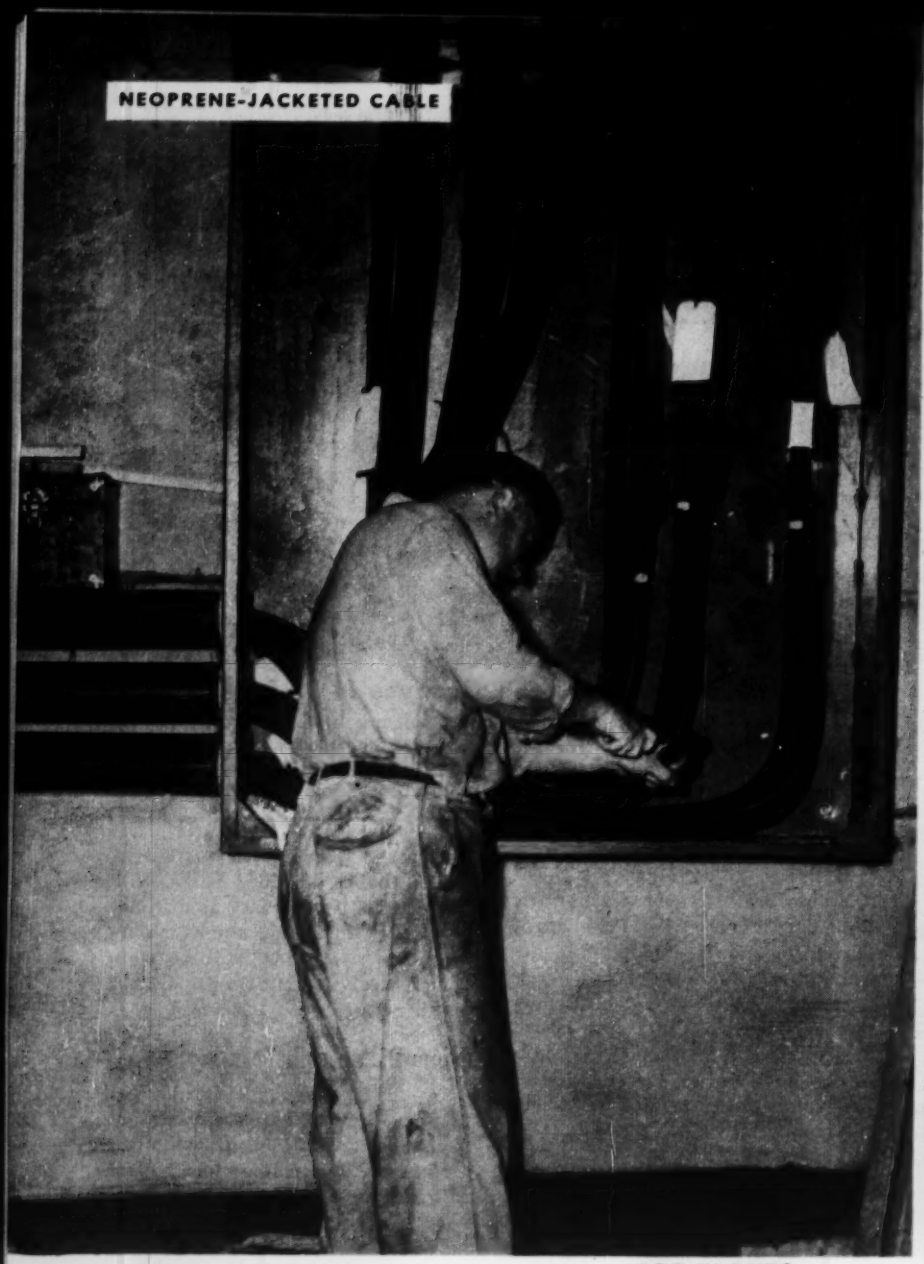
Plans Pittsburgh Terminal

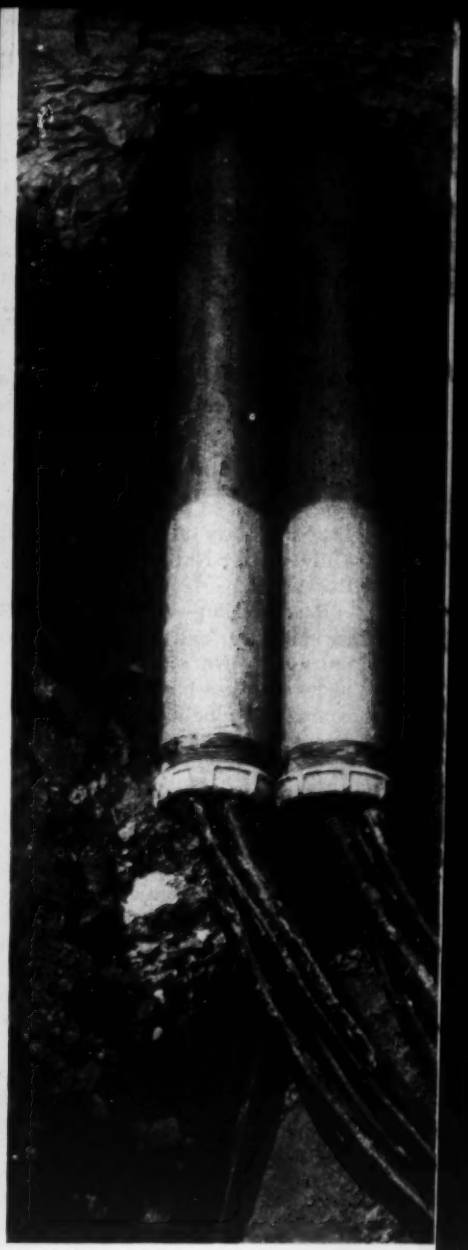
Union Barge Line Corp. and McKees Rocks Industrial Enterprises, both of Pittsburgh, will open an integrated terminal for barges, railroad cars and trucks on a 103-acre site on the Ohio river, 3½ miles below the Golden Triangle. Officials of the firms say the facility offers unlimited possibilities for the shipment of raw materials and finished goods into and from this area. The property formerly was owned by Pressed Steel Car Co.

Micro Switch Revamps Staff

A geographical realignment of sales divisions and a number of changes in top sales personnel are announced by Minneapolis-Honeywell Regulator Co.'s Micro Switch Division, Freeport, Ill. Under the new setup there is a Western Sales Division under the managership of Emmett N. Hughes, Los Angeles, and an Eastern Sales Division un-

(*Please turn to page* 80)





. . . FOR PLANTS

How to get premium wiring for little more

The cable to use is DURASHEATH.
Its actual over-all cost is so little more than the cheapest cable

Wait! Before you buy cable on price alone, see how *little* a premium wiring job actually costs. And what good insurance it is!

When you're wiring up, for power or lighting, the price of wire and cable is but a *fraction* of the over-all cost. Simple arithmetic follows — *it makes very little difference in the total cost of the job* whether you buy

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the cheapest cable or a premium cable like neoprene-jacketed Durasheath*.

But what a difference there can be in performance!

Anaconda's Durasheath is tough . . . heat-resistant . . . long-lasting. Its rugged neoprene jacket resists moisture, chemicals, sunlight, corrosion, electrolysis, abrasion and mechanical injury. It delivers real service dependability year after year.

And Durasheath is good for almost any job you have. You can bury it directly in the ground . . . run it in damp ducts . . . string it overhead . . . in *one continuous run* with minimum splicing. Order through your Anaconda Sales Office or distributor. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

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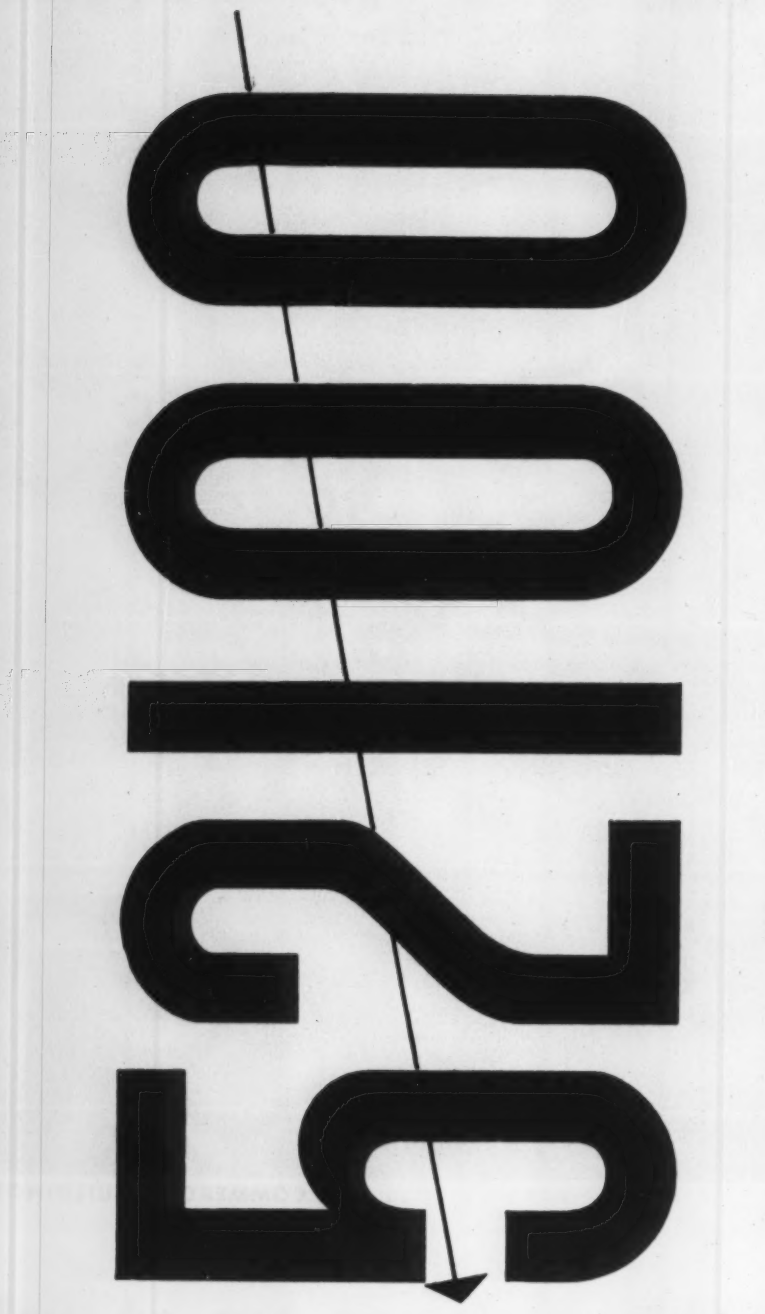


TUBES · BARS · FORGINGS · WIRE

PETERSON STEELS, INC.
UNION, NEW JERSEY
Detroit, Michigan • Chicago, Illinois

(*Concluded from page 77*)

der the managership of John K. Lincoln, Freeport. Anderson Wacaser, former Central Division manager with headquarters in Cleveland, is now head of market research in the home office.

Newport Steel Adds Branches

Newport Steel Corp., Newport, Ky., established four more district offices and appointed another representative as a further step in its continuing program to expand its plant facilities and sales force. New district territories are assigned to: Robert Duenner & Co., Tulsa, Okla.; Voss-Davidson Sales Co., Detroit; Fred Currie, Los Angeles; and John B. Church & Co., Houston. James C. Wiley, with headquarters in Muncie, is the new agent for northern Indiana.

Lockheed To Build Laboratory

Lockheed Aircraft Corp., Burbank, Calif., will construct a $10-million scientific laboratory for advanced research by its Missile Systems Division at Van Nuys, Calif. Dr. E. H. Krause will head up the unit.

Seaporcel Opens Branch

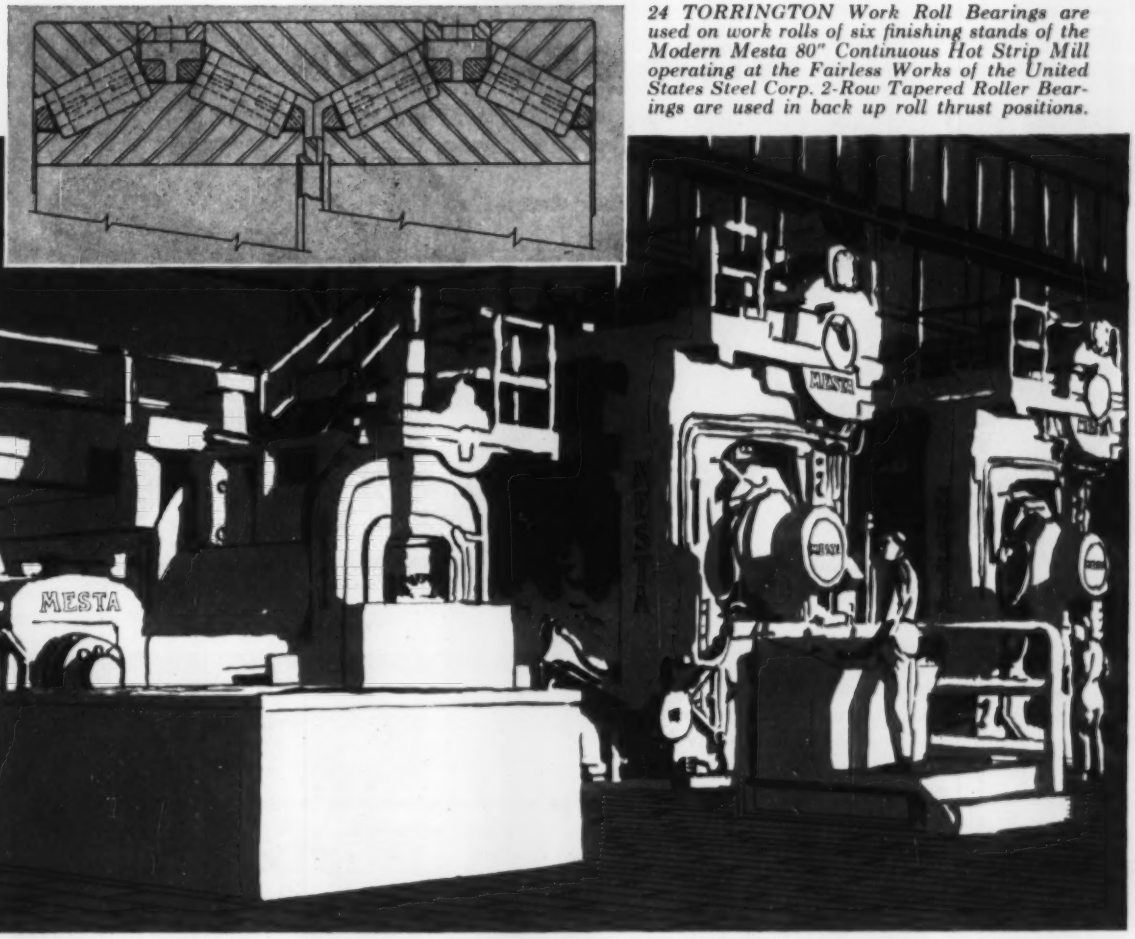
Seaporcel Metals Inc., Long Island City, N. Y., manufacturer of architectural porcelain enamel, opened a district office at 1616 Walnut St., Philadelphia. The office is headed by Jerome R. Salton.

Steel Grid Producer Expands

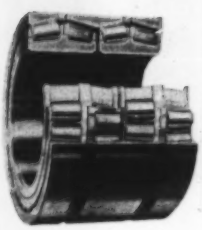
Bufnel Co. Ltd., Hollydale, Calif., expanded production facilities for manufacture of its reinforcing, heavy-duty steel grid—sometimes called surface armor.

Byron Jackson Buys Rollin Co.

Byron Jackson Co., Los Angeles, acquired Rollin Co., Pasadena, Calif., manufacturer of high-precision testing equipment. Jackson makes pumps and oil well tools, as well as being active in researching and developing electronic products. Paul J. Holmes, formerly president of Rollin, is general manager of Byron Jackson Co.'s Electronic Division. Plans are under way to acquire or construct a plant to



24 TORRINGTON Work Roll Bearings are used on work rolls of six finishing stands of the Modern Mesta 80" Continuous Hot Strip Mill operating at the Fairless Works of the United States Steel Corp. 2-Row Tapered Roller Bearings are used in back up roll thrust positions.



For longer service

Only the finest quality, electric furnace, alloy steel is used in TORRINGTON Work Roll Bearings. The bearings are carefully heat treated and carburized to provide qualities of toughness and hardness, stability and uniformity . . . thereby making it possible for them to withstand the rigors of modern, continuous hot strip rolling. The steep angle construction of the bearings guarantees maximum thrust capacity. One-piece, cast bronze cages for each roller path and machined pads in each roller pocket improve the over-all performance and lengthen bearing life.

Specify TORRINGTON Work Roll Bearings for greater rolling efficiency . . . longer low maintenance service. TORRINGTON bearings are available in a variety of types—including Cylindrical, Tapered and Spherical Roller—capable of handling any combination of thrust and radial load. Call a TORRINGTON engineer for consultation on your bearing problems.

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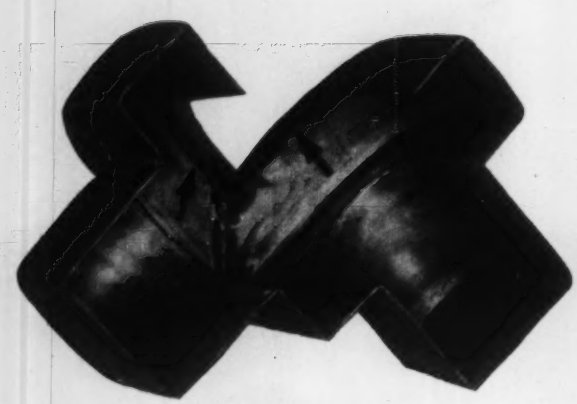
Production costs cut 90%

WITH GRAY IRON



Gear cover fabricated from nine pieces. Arrows show cut-outs.

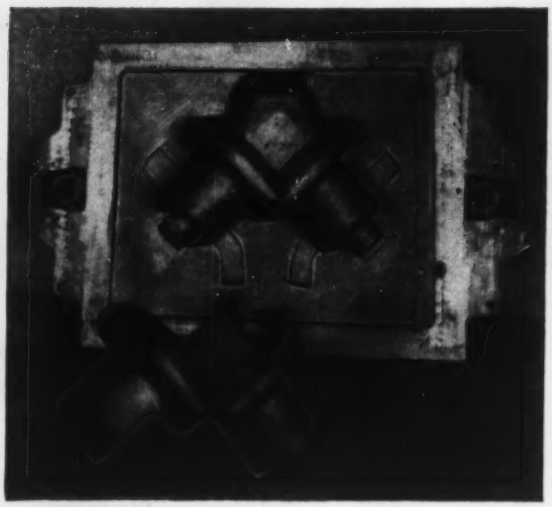
Made entirely in green sand, the Gray Iron castings were produced at one-tenth the cost of fabricated gear cover.

Formerly, nine separate pieces were shaped and welded into a fabricated gear cover for a braiding machine. Then, the manufacturer redesigned the gear cover for production in Gray Iron.

The finished and machined casting cost *less than 10%* of the production cost for the fabricated piece. This saving quickly paid for pattern-equipment costs . . . netting a *90% saving* on all parts thereafter. By redesigning for Gray Iron, the manufacturer not only made substantial savings, but obtained the advantages of a streamlined, vibration-absorbing gear cover.

Look at the structural and functional requirements of your fabricated parts. You can undoubtedly use the unique characteristics of Gray Iron—and the economy offered by this casting process. Why not write us for more information?

Matchplate and gear cover.



GRAY IRON CHARACTERISTICS INCLUDE:

Castability	Low Notch Sensitivity	Corrosion Resistance
Strength	Wear Resistance	Durability
Rigidity	Heat Resistance	Vibration Absorption
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75% of all cast metal products are Gray Iron

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Three Legs To Stand On

High above General Motors' Technical Center near Detroit a 250,000-gallon stainless-steel-clad water tower nears completion. Three steel columns, each 6 feet in diameter, support the towering structure. One column houses piping and a ladder

house the larger engineering and manufacturing facilities.

Firestone Builds Missile Plant

Firestone Tire & Rubber Co., Akron, is building a $2-million factory in Los Angeles for production of guided missiles for the Army.

Peters Stamping Buys Company

Peters Stamping Co., Toledo, O., purchased Alfred Johnson Ice Skate Co., Chicago, and will operate it as a division. Manufacture of figure skates has begun at the Peters plant in Toledo.

Aero Engineering Opens Branch

Aero Engineering Co., a division of Garrett Corp., Los Angeles, opened an office in St. Louis. Donald E. Flinn heads the company's sales activities in that area.

Canada Gets Pennsalt Chemicals

Pennsylvania Salt Mfg. Co.'s Chemical Specialties Division, Philadelphia, established Pennsalt Chemicals of Canada under the managership of W. B. Billingsley. Sales office and warehouse facilities will be located in Hamilton, Ont.

Finkl Steel Grows

Finkl Steel Products Corp., Los Angeles, acquired property in South Gate, Calif., for expanded warehousing of steel products.

Fastener Company Renamed

Stronghold Screw Products Inc., changed its name to Hercules Fastener Corp. The firm makes screws, nuts, bolts, rivets, Phillips head screws and all headed and threaded products and specials. Headquarters are in its new factory, 1801 W. Winnemac Ave., Chicago.

Hughes Aircraft Leases Space

Hughes Aircraft Co., Culver City, Calif., leased two new industrial buildings, containing 45,000 sq ft of floor area. They're for engineering purposes.

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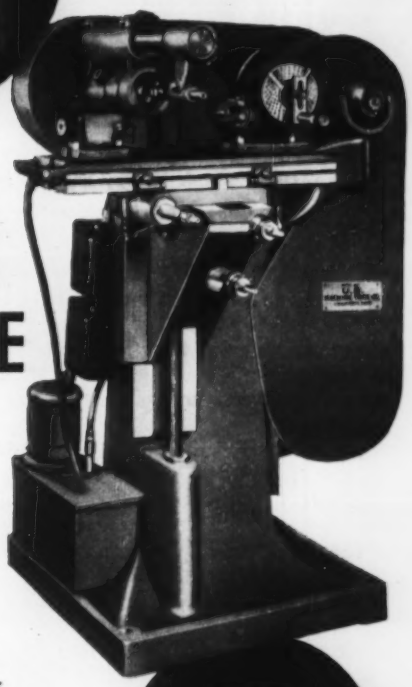
CAN DO AS MUCH AND DO IT AS WELL AS MILLING MACHINES THAT COST UP TO TEN TIMES MORE!

HORIZONTAL MILLING MACHINE



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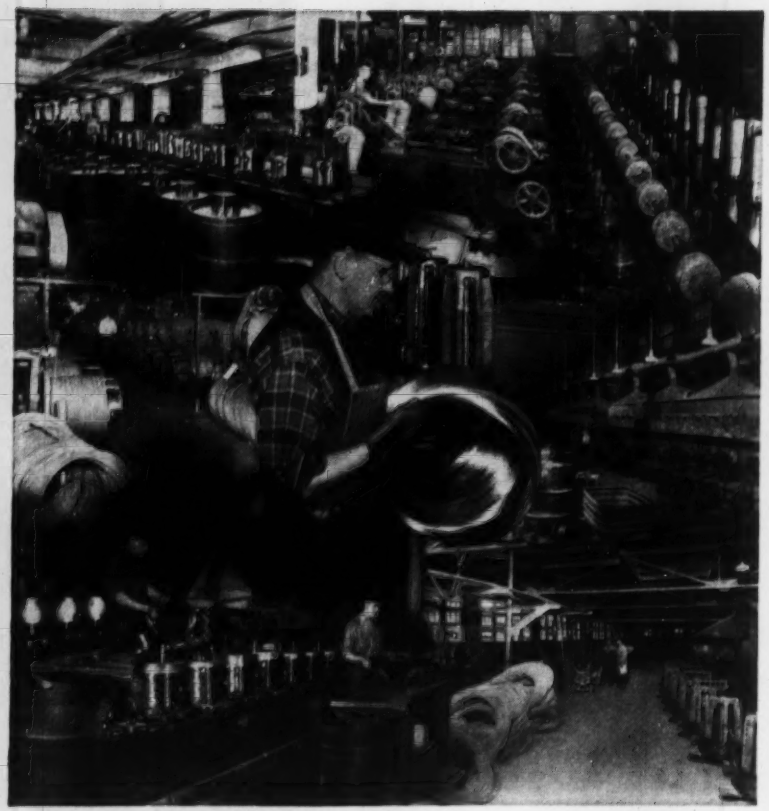

Using atomic energy only for the atomic bomb is like using electricity only for the electric chair.

American progress must not be confined to war alone. But discoveries that have their first conception in self preservation through force can be turned to use in peaceful pursuits. We are doing our part in defense production, but we also have a clear vision of work for a peaceful, happier America—carrying on with lessons war production has taught us—to meet in the most economical way the requirements of industry.

JOHNSON STEEL AND WIRE COMPANY, INC.

WORCESTER 1, MASS.

New York Philadelphia Pittsburgh Cleveland Detroit Akron
Dayton Chicago Atlanta Houston Tulsa Los Angeles

A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

Wilmot Castle Building Plant

Wilmot Castle Co., Rochester, N. Y., surgical equipment manufacturer, is constructing a building which will have 136,000 sq ft of floor space and will serve as headquarters for the company.

Eastern Firm Buys Dazy Corp.

Landers, Frary & Clark, New Britain, Conn., purchased Dazy Corp., St. Louis, manufacturer of nonelectrical kitchen products. Dazy Corp.'s subsidiary, Loyd Scruggs Co., which manufactures small electrical motors in Festus, Mo., is not included in the deal.

Comfort Spring To Open Plant

Comfort Spring Co., Baltimore, will occupy a $125,000 plant in the New England Industrial Center, Needham, Mass. The company will produce coiled bedding and upholstery springs.

Metalworking Firm Renamed

Milwaukee Metal Working Co., Milwaukee, changed its corporate name to Wisconsin Hydraulics Inc. The firm makes hydraulic motors, pumps, valves and cylinders.

Production Facilities Pooled

Here's a new idea in heavy industry: Salem-Brosius Inc. and Phillips Corp., both of Pittsburgh, have agreed to pool production facilities, without changing their separate corporate identities. Salem-Brosius is leasing 45,000 sq ft of space in the Phillips factory building adjacent to the Salem-Brosius plant in Carnegie, Pa. Salem-Brosius will use this portion of the Phillips plant, plus its own building, to carry on manufacturing activities for both companies. Salem-Brosius will handle Phillips production work on a contract basis, using its present facilities, plus equipment to be purchased for Phillips.

Salem - Brosius manufactures heating and heat-treating furnaces and special machinery for the ferrous and nonferrous metals producing and fabricating industries. Phillips Corp., maker of mine cars and other mine and mill supplies.

FOR MOLDING GRINDING WHEELS

ERIE

TYPICAL of the hydraulic presses designed and built by Erie Foundry Company is this one in the plant of a leading manufacturer of grinding wheels.

OVER 50 years' experience in the manufacture of metal, rubber and plastic-forming presses is represented here. Consult with us on your hydraulic press requirements.

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Dependable **HYDRAULIC PRESSES • FORGING HAMMERS**

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A Conco Crane, custom-designed for a specific application, can cut costs sharply. A modest crane investment can return important profits. Let a Conco engineer show you how. Write for a representative to call, or ask for Bulletin 3000A covering the complete Conco Crane line—a line backed by 37 years experience.
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Conco Building Products, Inc.—Brick, Tile, Stone

is devoting increasing attention to production of materials handling goods, such as trailers, shipping containers, furnace and transfer cars and skids, for the automotive and general metalworking fields.

Ward A Wickwire Jr., president of Salem-Brosius, and John M. Phillips Jr., president of Phillips Corp., expect full scale pool operations to start by Oct. 1.

Enters Plastic Diemaking Field

Arrowsmith Tool & Die Corp., Los Angeles, branched into the plastic diemaking field with the purchase of a 10,000-sq-ft plant. The new operation will be called Arrowsmith Plastic Tooling Inc.

Kaplin Buys Ralston Steel Car

Thomas L. Kaplin of Toledo, O., purchased Ralston Steel Car Co., Columbus, O. He will operate the property as Ralston Inc. and will lease the factory building or erect new ones to specifications of tenants.

Steel Treating Firm Expands

Industrial Steel Treating Co., Los Angeles, erected a building adjacent to its factory at 3370 Benedict Way, that city, for increased plating and heat-treating operations.

Clearing Machine Opens Office

Clearing Machine Corp., Chicago, opened a direct factory office at 5 St. Paul St., Rochester, N. Y. Robert J. Falsey is in charge of the office.

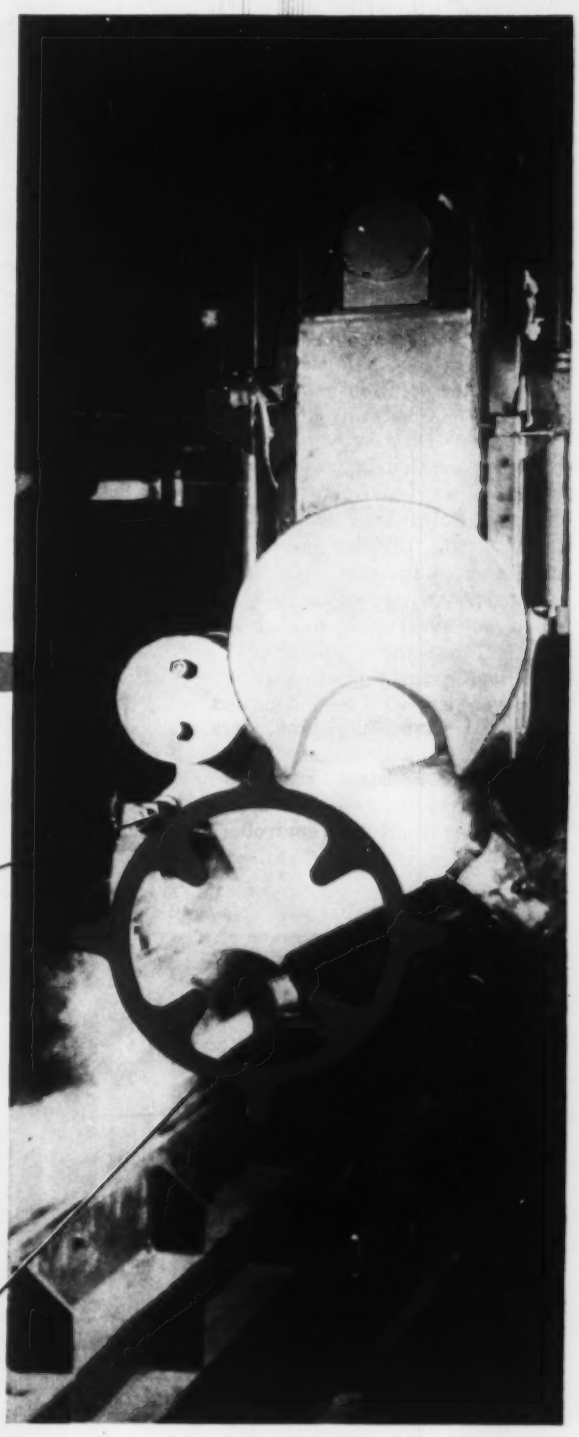
NEW ADDRESSES

Binks Mfg. Co., Chicago, maker of spray painting equipment, moved its factory branch to 3276 N. Weil St., Milwaukee.

Otto H. York Co. Inc. and **York Process Equipment Corp.** relocated offices and plants in larger quarters at 6 Central Ave., West Orange, N. J. Otto H. York Co. products include liquid extraction mesh products, mist eliminators and separators. York Process Co.

let us take a closer look at your

"difficult to solve" problems involving tubing and solids of special alloys and cross-sections



Two years of experimental production and several thousand tons of finished extruded products have given B&W a background that can be put to work for you in solving problems involving tubing and solids of special alloys and cross-sections. Through extrusion at B&W:

1. **New alloys have become commercially available as seamless tubing.** These include certain proprietary alloys and various types of ferrous alloys which have been known previously as non-pierceable materials.
2. **Tubing having certain special shaped cross-sections has been produced commercially.** This includes tubing having inside and outside shapes which are independent of each other, such as circular OD-finned ID, used to solve special heat transfer problems.
3. **Solids having special shaped cross-sections have been produced.** These include shapes difficult or impossible to produce as rolled sections.

Through extrusion, Mr. Tubes, your local B&W Tubing Representative, has helped others to solve problems involving tubing and solids of special materials and cross-sections. Call on him if you have such problems; chances are he will be able to help you.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W SEAMLESS and WELDED TUBES

TA-4032(X)

products include liquid extraction columns, line separators and custom-engineered process vessels.

Taft-Peirce Mfg. Co., Woonsocket, R. I., moved its Detroit sales office to 10243 Puritan Ave. Raymond F. Jalbert, K. Thomas Bryant and Roy R. Winn, sales engineers, are located at this address.

Motch & Merryweather Machinery Co., Cleveland, is observing its 50th anniversary this month. The company has six divisions: Machine Tool Distributor Division, Cutting Tool Distributor Division, Machinery Mfg. Division, Used Machinery & Rebuilding Division, Cutting Tool Mfg. Division and Triple-M Production Division.

Motch & Merryweather, now in its second generation, has as officers: E. Franklin Motch, president and treasurer; George E. Merryweather, vice president and secretary; Clare R. Kubik, vice president, administration; Henry A. Murton, assistant treasurer; W. F. Edwards, assistant secretary; Milton R. Kubik, controller; and W. J. Chamberlain, director of sales.

ASSOCIATIONS

Elmer R. Kaiser was appointed director of research, **American Society of Heating & Ventilating Engineers**, New York. He has his headquarters at ASHVE Research Laboratory, Cleveland. L. N. Hunter is president of the society.

Air Materiel Command, Wright-Patterson Air Force Base, Dayton, O., presented the Meritorious Civilian Service Award to Carl H. Burton for outstanding service as a consultant. The presentation was made by Gen. E. W. Rawlings, AMC commander. Mr. Burton is secretary of **Aluminum Research Council**, Chicago.

REPRESENTATIVES

Allis-Chalmers Mfg. Co., Milwaukee, appointed McJunkin Corp., Marietta, O., and J. H. Nicholson Supply Co., Omaha, Nebr., as distributors of its General Machinery Division products; Industrial Supply Co., Bellingham, Wash., as distributor of its V-belt drive equipment; G. A. Fleet Co., White Plains, N. Y., as distributor of its controls and pumps; and N. B. Nichols Co., Little Rock, Ark., as distributor of its motors, controls and transformers.

Benchmaster Mfg. Co., Gardena, Calif., maker of small punch presses and milling machines, appointed Camley International Co. Inc., Los Angeles, as representative to handle its foreign sales.

W. H. Summers Co., Cleveland, has been appointed as a stocking distributor of hose, belting and packing produced by **Lee Rubber & Tire Corp.'s** Republic Rubber Division, Youngstown.

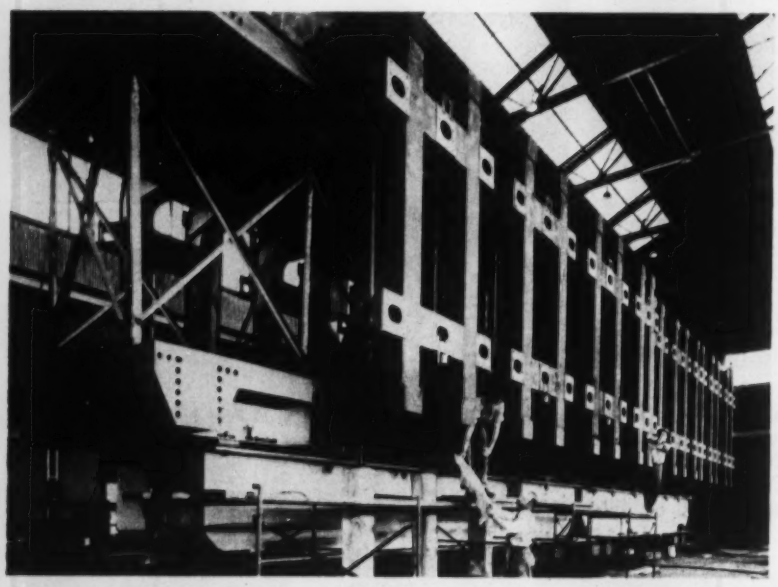
Ready Tool Co., Bridgeport, Conn., manufacturer of centers and grinder and milling machine dogs, appointed as its representatives: Roger W. King, Meriden, Conn.; B. S. Meade Co., Union City, N. J.; and Herren & Sims Co., Cleveland.

Automatic Methods Inc., Elizabeth, N. J., appointed Detroit Tap & Tool Co., Baseline, Mich., and B. C. MacDonald Co. with offices in St. Louis, Kansas City and Wichita, Kans., as distributors of its lead screw tapping tools.

Gerwin Industries Inc., Michigan City, Ind., appointed RAJAC Sales Equipment Corp., Lincolnwood, Ill., as exclusive sales representative for its pneumatic pipeline conveyor system for moving foundry sand.

Automatic Transportation Co., Chicago, maker of industrial trucks, appointed Hallidie Machinery Co., with offices in Seattle, Tacoma and Spokane, Wash., as its representative. The latter firm's Portland, Oreg., office, known as Hallidie Machinery & Equipment Co., serves Oregon.

Northrop Aircraft Inc., Hawthorne, Calif., granted an exclusive license to Aircraft Tools Inc., Los Angeles, to manufacture and market a Northrop-developed portable cable terminal swaging tool.



Steel Sheathes Supersonic Winds: A Job Well Done

These massive steel ribs will sheathe supersonic winds as easily as human ribs contain the air we inhale. They are engineered to support the throat section of the new wind tunnel at Lewis Flight Propulsion Laboratory, Cleveland. Work is being done for National Advisory Committee for Aeronautics at Ambridge, Pa., plant of U. S. Steel's American Bridge Division. They support heavy stainless steel flexible wall plates that control air flow in the tunnel's test section

Designed and built by

UNITED

4-HIGH 2-STAND TANDEM BRASS MILL

UNITED

ENGINEERING AND FOUNDRY COMPANY

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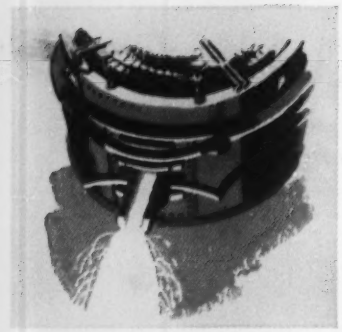
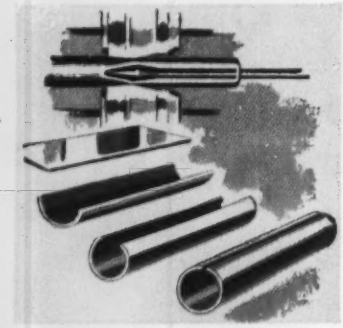
Ostuco Single Source Service Saves You Money!

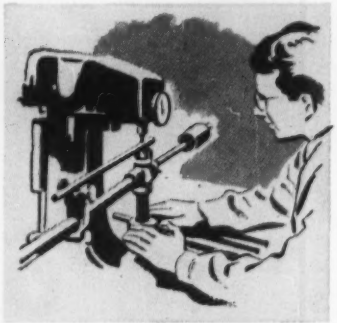
Wherever you use tubing in any form . . . or wherever the advantages of tubing will make your product more competitive . . . OSTUCO's *single source service* can save you money. One purchase order takes care of all details. Every manufacturing step from raw materials to finished product is carefully controlled and quality-checked. Your production schedules are rigidly maintained. Other advantages of OSTUCO's *single source service* are outlined in an informative booklet, "Ostuco Tubing," yours for the asking. Or better still—for conclusive proof—send us your blueprints for prompt quotation.



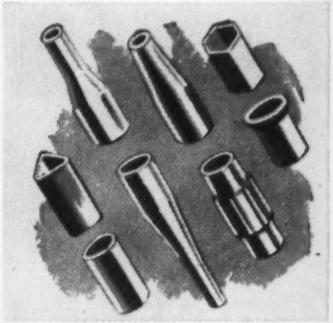
1. OUR OWN STEEL SOURCE. *As a member of the Copperweld family, Ostuco controls its own steel supply . . . your assurance of prompt deliveries.*



2. SEAMLESS AND WELDED TUBING. *As manufacturers of both seamless and electric welded steel tubing, Ostuco's facilities are flexible to meet your needs.*

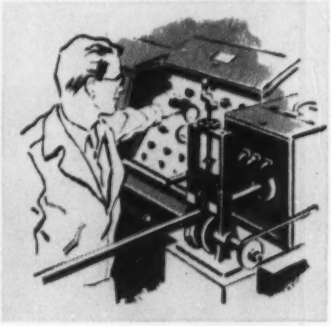


3. VARIOUS ANALYSES. *Ostuco offers carbon and alloy steels which meet all ASM, AMS, ASTM, AISI, and Federal specifications.*



4. FABRICATING AND FORGING. *Under one roof, Ostuco's modern equipment and skilled craftsmen provide uninterrupted manufacturing, fabricating, and forging service.*

5. SPECIALTY ITEMS. *Ostuco is especially geared to handle smaller production quantities with the same economy normally possible only in larger runs.*



6. QUALITY CONTROL. *Rigid inspection and precision tests at various stages of manufacture assure homogeneous quality and uniformity.*

7. CONSULTANT SERVICE. *The diversified knowledge and experience of Ostuco's engineering and design departments is always at your service.*

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CANADA, RAILWAY & POWER CORP., LTD.

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
117 Liberty Street, New York 6, New York

STEEL

September 6, 1954

Technical Outlook

HOW TIGHT— Lockheed's 8000 - ton hydropress is held together by four bolts. They're nearly 50 feet long and 2 feet in diameter. To check out before starting production, strain gages and leads were attached to each lead before installation. During erection, tightness was determined and equalized as a function of strain. When gage outputs were equal, all bolts were tight to the same degree. Later dynamic tests were recorded on a CEC recording oscillograph to get a complete performance picture.

CONSIDERS THE PRACTICAL— Picking the right cutting speed for any given job is sometimes a tricky business. Speed charts often give a starting point, but the final choice should depend on production demands, tool life requirements, cutting cost, etc. One company is developing data that will take into account initial recommendations, plus economic factors that will determine the best practical speed for any job.

NEW PALLET SPECS— National Wooden Pallet Manufacturers Association has revised its 1939 standard for general-purpose pallets. Key points: It establishes two industrial pallet grades, sets up a numerical system for type designation and places new limitations on fasteners and lumber.

WASTE RECOVERY— Breakeven point in plating room waste recovery may be reached in some ion exchanger installations. Frederic B. Stevens Inc. reports it is recording many instances where reclaimed materials have more than borne the dollar cost of installation and upkeep of ion exchange systems.

STRENGTH FOR ZIRCONIUM— Its high melting point makes zirconium potentially attractive for high-temperature use, but it suffers from poor mechanical properties at elevated temperatures. Work by Battelle with effects of binary additions shows tungsten the most effective strengthener from 1800 to 2200° F. None of the alloys was stronger than Inconel or 310 stainless in that temperature range.

X-RAYING CYLINDRICALS— X-ray examination of cylindrical fabrications is possible with the new 250,000-v unit acquired from GE by Acme Welding division. The apparatus operates in a 360-degree area, and can be introduced into cylindrical vessels with openings as small as 15 inches.

ALUMINUM ALLOY CONDUCTOR— Alcoa has come up with a new aluminum alloy that meets performance requirements of electrical equipment makers. No. 2EC makes a slight sacrifice in conductivity to take on what Alcoa regards as superior mechanical properties. It's important for applications requiring high yield, low creep.

DIMPLING TITANIUM— Ryan Aeronautical Co.'s recent Air Force study on fabricating titanium sheet indicates titanium dimpling problems are no greater than those with 75ST aluminum, but forming temperatures should be within 600 and 700° F to produce structurally-sound dimples, free from critical fracture strains. Satisfactory work can be done at lower temperatures, but inconsistent sheet stock precludes it.

ELECTRONIC BRAIN— U. S. Steel's National Tube Division is putting in a high-speed computer said to be the first in the metal industry and the second installation in this country. Known as UNIVAC, by Remington Rand, it is capable of handling all types of mathematical computations, plus sorting and classifying data that can be expressed in alphabetical or numerical characters.

Metalworking Outlook—p. 41 Market Outlook—p. 127

MATERIALS CONTROL—HOW TO DO A BETTER JOB

MATERIALS can account for 80 to 90 per cent of your total manufacturing costs.

With that kind of price tag riding on a purchase order, you can't afford to take chances with quality or disposition of incoming materials.

Guarantee Quality—There's really only one way to guarantee quality and that's in the supplier's plant. The problem, of course, is to convince him of this and get him to do something about it.

In point is the experience a company had when it broached the subject to vendors. Some threatened to up the price if quality control were made mandatory; most were evasive. Opinions on what is a fair quality level varied from 5 to 20 per cent defective; but all agreed these figures never were mentiond in quotations.

The solution is twofold. First must come an effective, continuing receiving inspection system that will keep you, the buyer, completely aware of quality coming from every supplier, as well as prevent use of defective materials. Armed with these facts, a constructive remedial approach can be made to the supplier.

Workable Identification — Control of materials after inspection presents a different problem—one that is primarily internal, but of equal importance. Many identification numbering systems break down, usually because they are not sufficiently expansible to meet changing purchase patterns and increases in kinds and types of particular materials.

The test is to see if your system will identify any size, type and kind of part class, plus being expansible in the ratio of about 10 to 1 at any point. You will also want adaptability to punched card control. For example the all-numeric code described here handles 100,000 items, can take 10 billion, and is adapted to punched card procedure throughout its operation.

Quality Control of Purchased Materials

By STEPHEN J. ROGERS
Manager, Material Quality Section
Ford Division
Ford Motor Co., Detroit

TO GUARANTEE and sustain the quality of his product, every manufacturer first must be certain his basic materials are top quality. Quality of materials is doubly important to assemblers, because everything but possibly skill of assembly depends on items received from outside sources.

A critical examination of our own receiving inspection techniques gave us new goals to shoot at: To prevent use of defective materials; to produce facts necessary to effect prompt correction of defects at the source.

Material Specialists — The first step was to hire a group of men we call material technical specialists. Each is an expert in a particular field, such as chemical engineering, gear manufacture, etc. We established eight material categories, assigning responsibility for each to a specialist.

Next, we designed an inspection operation sheet on which can be detailed characteristics to be inspected, method and schedule of inspection. When part prints are released by engineering, technical specialists process them, selecting points to be inspected, marking and classifying them by order of importance.

Characteristics are rated under the heading of safety, critical, major, minor or incidental — of course, depending upon their significance to the satisfactory function of the assembled product.

The highest individual characteristic within the part determines the class of the part itself. For example, a part containing major, minor and incidental characteristics is regarded as a major.

Frequency of Inspection—Quality control analysts group these characteristics by classification, describe them, assign frequency of inspection to each class and determine frequency of laboratory and layout inspection.

Receiving inspection of characteristics designated critical and safety is scheduled for every shipment. Receiving inspection of major, minor and incidental characteristics is scheduled in accordance with the nature of those characteristics and the supplier's shipping schedule. Frequency assigned to lab and layout inspection depends again on the nature of the part and its shipping schedule.

Rejections — Two other factors affect the amount of inspection each part gets. If a shipment is rejected, the schedule immediately reverts to a frequency of one—a complete check on each shipment

—for the particular group of characteristics or type inspection involved and remains at one until released by an accepted shipment.

If a characteristic not scheduled for inspection is found defective in assembly, a special inspection is performed on the shipment involved. If rejected, the group of characteristics is placed on a frequency of one until released by an accepted shipment.

How to Inspect—In addition to establishing when and what to inspect, the inspection operation sheet covers the procedure to be followed in doing the job. A gage specialist reviews the sheet and makes recommendations. When gages have been agreed upon, designed and procured, the gage identification number is added to the operation sheet.

Some parts do not lend themselves to the normal type of inspection operation sheet. Complexities arise from repetition of characteristics in different locations. In these instances, a special sheet pictures and codes weld patterns, subassembly fits and the location and shape of important holes. In addition, we have coded appearance defects such as dents, dings, die marks, buckles, etc., and provided a coded location pattern. Thus, we are able to standardize inspection and reporting at widely separated points. More important, we establish an easily-interpreted means of communicating with our suppliers.

Application of Schedules — To apply the inspection schedules established on the inspection operation sheet, each part has an IBM card. Cards contain part name and number, supplier name, shipping point, buyer code, purchase order number, material classification and inspection schedule.

For each shipment, the Card-a-type operator pulls from his file the master card applicable to the particular supplier, shipping point and purchase order number. He tallies the shipment and determines what types of inspection are required on the basis of his records for that part, then schedules inspection.

With an automatic tape punch, record of supplier, part and scheduled inspection is made to produce inspection follow-up cards. The latter are used to follow up each scheduled inspection and provide a daily record of the number and types of inspection scheduled in each material class.

Philosophy of Correction — Our objective is to actively assist our suppliers in correcting products at the source rather than simply preventing defective material from use in production. A simple report of a defect's existence to a supplier usually accomplishes little. It's here that our technical specialists play another vital role.

After copies of completed inspection reports are processed, cards representing rejection are listed by material classification. The lists serve as a register for following up and recording action and go to the specialist with the inspector's reports. The latter takes action on each rejection.

First, he contacts the supplier, informs him of the rejection, the cause and determines what corrective action the supplier intends to take. Many times the supplier is aware of the problem and has a corrective date established. If the latter is unaware of the situation, he is requested to investigate and inform us of the action he plans—and give us the date that action will be effective. Many times, of course, a conference is required to discuss the problem and methods of correction.

Quality Records — We employ two types of monthly records in our discussions with suppliers. The first, called Part Quality Record, is a detailed, chronological report of all shipments received during the month, all inspection and all action taken by our specialists. The second, a Supplier Quality Record, lists for each supplier all parts shipped and gives a three months' summary of his performance. Its effect is to establish a solid concept of the quality the supplier has produced over an extended period.

When a persistent defect, a failure to correct a cause for rejection occurs, we have a course of attacking the problem other than scrambling to salvage usable parts or switching suppliers.

Up to Management—When a specialist contacts a supplier, he's in possession of the facts. If the defect is of unknown origin or is technically difficult to correct, he is available for consultation, working with the supplier at his plant to discuss cause and correction.

In many cases, however, this still is insufficient. Realizing that a supplier's production and quality control personnel sometimes are unable to act decisively, we have one more step. When the supplier has failed to correct or had intermittent success in controlling a troublesome characteristic, we meet with his management to examine problems involved.

Our discussions are not limited to defects found in his last shipment. We may consider his equipment, inspection methods, raw material or any other factors that bear on performance. Our experience has been that once fully appraised of the extent and seriousness of a problem, management moves swiftly to control it.

Adapted from a paper prepared for the annual convention, American Society for Quality Control, by Stephen J. Rogers, manager, Material Quality Section, Ford Division, Ford Motor Co.

OUTLINE FOR RECEIVING INSPECTION

After examining its procedure in receiving inspection, Ford established these criteria for spotting defects and correcting them at the source.

1. Establish a firm schedule of inspection for each part. Where low inventories require frequent repetitive shipments, it's impractical to inspect every shipment. In addition, statistical control methods demonstrate advantages of controlled sampling.

2. Assign selection and classification of inspection characteristics to qualified process engineers specializing in particular types of material, parts or assemblies.

3. Record inspection results in a flexible form which will lend itself to review, comparison and discussion with a minimum of delay.

4. Originate a common, fixed language for use between purchaser and supplier to promote ready understanding and proper interpretation of inspection rejection reports and findings.

5. Obtain personnel qualified to analyze a manufacturing process, determine its faults and make recommendations to the supplier.

BOX NO. 1

These factors were determined as objectives to be met by Eastman Kodak's new system. Obviously certain compromises were necessary, since no single arrangement could satisfy all requisites. However, they serve to illustrate scope and complexity of the problem and indicate what can be accomplished.

1. All numbers should be significant. This might require 15 to 20 digits in some cases—such as for cutting tools. On the other hand, the number must be short as possible to hold down clerical effort, copying errors.

2. The number should have a variable length, similar to the Dewey decimal system, to permit unlimited expansion for new items. However, we were faced with knowledge that a fixed length was necessary for use with a punched-card stock control system.

3. All items, when sorted in numerical sequence by a punch card system, should group similar items together to facilitate inventory control and take-off for requisitions and purchase orders. In this way, items carrying group discounts or those that should be considered for purchase at one time or from one source would be grouped. But other considerations indicated that items, when sorted in the same manner, should arrange themselves in alphabetic order so any item could be located readily by name in the stores records.

4. The system should be able to absorb new items readily without upsetting any established numbers or sequence of numbers. This is a major problem, usually an important factor in breakdown of established systems having significant numbers.

5. A number, once assigned, should never be changed. However, we knew this would be theoretically impossible and believed the best we could do was develop a system to keep changes to an absolute minimum.

6. The system should be designed to handle about 100,000 items, with expansion to about 200,000.

An Identification Numbering System for Purchased Materials

By P. J. CALLAN
Material Standards Department
Eastman Kodak Co.
Rochester, N. Y.

IDENTIFICATION numbering systems have one thing in common: They're all different.

They differ because the purposes for which they are designed are different. The significant facets of Eastman Kodak Co.'s over-all system can be applied to facilitate similar identification numbering arrangements.

What Materials?—Numbers apply only to items of purchased materials—raw materials for production, such as sheet and strip metals, chemicals, plastics, etc.; or finished items for maintenance and supply, such as structurals, piping, lubricants and lab supplies.

The code does not include, or have anything to do with, production parts, parts in process, products for sale or capital assets.

A Single System—When we decided to overhaul the systems used in our standards catalog and stores departments, the catalog had about 30,000 items and used a 7-digit numeric code. The stores system, containing about 50,000 items, used an alpha-numeric system, varying from 5 to 7 letters and digits.

Each was reasonably satisfactory, but the dual system was a disadvantage. In addition, neither was particularly adaptable to punched card stock control, which was receiving serious consideration at the time.

Question of Digits—Our solution is a single system, with a 10-digit all-numeric number, meeting requirements outlined in Box No. 1. The number has three groups of digits, of three, four and three respectively. Letters are not used because they are more difficult to break up on punched-card systems. Hyphens serve to break the number up into easily-handled groups.

Experience with the two former systems indicated that 6 or 7 digits was the minimum that could be used. Extending this to 10 increased flexibility several hundredfold. Extra time required to handle the larger number in writing requisitions and in key punching and sorting cards does not become an important factor. On the basis of 5000 transactions a day, it totals about 8 manhours—a small price to pay. Neither is the longer number responsible for a significant increase in the number of clerical errors.

Material Tie-In—To satisfy inventory control requirements and facilitate grouping of related items on purchase requisitions and orders, the number is tied in to a materials classification system. Typical relation of coded numbers to materials is seen in Table 1.

All materials are divided into 100 basic classifications. The number given to any class becomes the first two digits of the number as-

signed to every individual item in that class. All items can be classified into rather broad categories of materials, arranged in a logical progression of kinds.

Classification is based primarily on considerations of procurement—where the items are most likely to be found in the selling outlets. For example, we classify a small pulley as "hardware" if it generally is listed in hardware catalogs and carried by jobbers who specialize in hardware items. But, if the pulley is of a type generally found only in catalogs covering material handling items, we classify it with the latter.

Subdivisions — After assignment of the first two digits, or class number, each class is further subdivided into 10 subclasses. For example, Class 20 covers cutting tools, which can be subdivided conveniently into kinds, with the same factors and reasoning that apply to the classes themselves applied to the subclasses. In subclass 20(0) we have gathered drills, reamers, counterbores, etc. — in general made by the same manufacturers and used in the same type of operation and on the same machines.

Saws, on the other hand, logically fall into another subclass of the cutting tool class under the manufacturer-use reasoning. They get the two initial cutting tool digits, 20, but have another subclass digit.

Automatic Grouping—Up to this point, a numerical sorter will automatically group all similar items. This is as far as we go, however, to satisfy requirements for classification that are regarded ideal.

We have not found it feasible to carry the principle beyond this point for two reasons: First, it becomes too difficult to make decisions because differences become less well defined; and second, because it is too difficult to locate a given item in the records system. Beyond this point, we have favored the other initial requirement that calls for number assignment in such a manner that items will arrange themselves in alphabetic order when sorted numerically.

Kinds, Types — Again working with subclass 200, the alphabetizing principle is extended without difficulty through "Kinds," "Types" and "Sizes." Designation of kind, in the fourth and fifth digits, progresses according to alphabetic listing, as in Table I. In accomplishing this, we have used less than one-tenth of all the available numbers at this point.

Carrying the principle one step further, the various types of one of the kinds are arranged alphabetically in the sixth and seventh digits. Again, the system can absorb 10 times as many new types as are shown in Table I.

Size is probably the next most important consideration. And sizes of each type item can be arranged progressively by assigning appropriate numbers in the eighth and ninth digits. This leaves the tenth digit free to show variations.

Variable Patterns—It is unnecessary to fit all kinds of material into this same pattern—class, subclass, kind, type, size. Number assignment patterns are variable and can be altered to fit conditions.

This is illustrated by the assignment made to machine screws. These are so numerous they have the entire class 25 to themselves. There are no subclasses. Digits three and four can go to cover head types. Next three digits are used to cover sizes. Then, because there are so many variables—metals, alloys, finishes, threads, etc., we allowed them the last three digits.

No confusion results from variation in number assignment patterns because we have a code book in which the pattern for each subclass is recorded.

TABLE NO. 1

Classification by numbers on an automatic sorter is employed through class and subclass. But beyond the first three digits number assignment is made so items arrange themselves alphabetically when sorted numerically.

Subclass 200—Drills, Reamers, Counterbores, etc.

Kinds of Items	Identification Number
Augers	200 — 10 XX — XXX
Bits	200 — 20 XX — XXX
Counterbores	200 — 30 XX — XXX
Countersinks	200 — 40 XX — XXX
Drills	200 — 50 XX — XXX
Extractors	200 — 60 XX — XXX
Reamers	200 — 80 XX — XXX

Subclass 200—Reamers Only

Types of Item	Identification Number
Reamer, bridge, taper	200 — 80 05 — XXX
Reamer, chucking, fluted	200 — 80 30 — XXX
Reamer, chucking, rose	200 — 80 35 — XXX
Reamer, hand	200 — 80 60 — XXX
Reamer, hand, expansion	200 — 80 62 — XXX
Reamer, pin, taper, helical	200 — 80 70 — XXX
Reamer, pin, taper, straight	200 — 80 75 — XXX
Reamer, shell, spiral	200 — 80 85 — XXX
Reamer, shell, straight	200 — 80 88 — XXX

Subclass 200—Hand Reamers Only, Size Listing

Hand Reamer Sizes	Identification Number
Reamer, hand, 1/8	200 — 8060 — 10 X
Reamer, hand, 9/64	200 — 8060 — 12 X
Reamer, hand, 5/32	200 — 8060 — 14 X
Reamer, hand, 11/64	200 — 8060 — 16 X
Reamer, hand, 3/16	200 — 8060 — 18 X
Reamer, hand, 13/64	200 — 8060 — 20 X

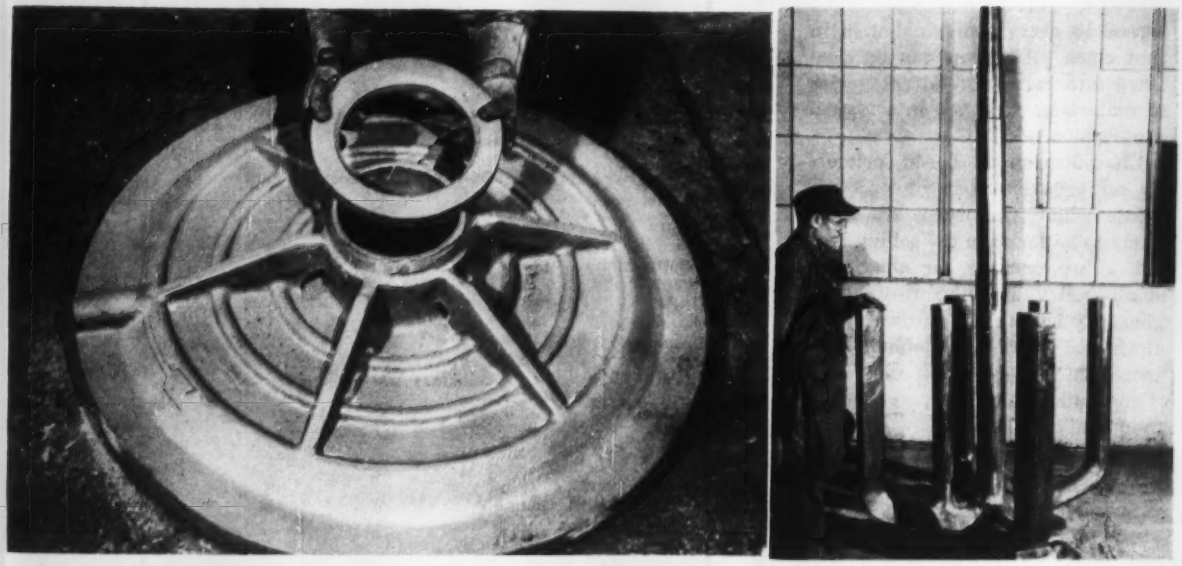
TABLE NO. 2

Number Assignment Patterns Are Variable

Here are four typical variations that work to adapt the system to particular types of product.

Reamers	200 — KKTT — SSM
Wire Cloth	172 — KTTS — SSM
Steel Strip	011 — TTTS — SSS
Machine Screws	25T — TSSS — MMM

Digits K are assigned to Kinds
Digits T are assigned to Types
Digits S are assigned to Sizes
Digits M are assigned to Minor Variables



By welding flange on large ribbed disc, manufacturer saved a large core and eliminated difficult feeding. Main casting consists of four fingers in one plane with a center piece slightly taller than fingers. Two additional curved fingers were cast separately, then welded on. Center arm extension was also welded later

Cast-Weld Construction Bypasses Complications

Designers need not rule out big, complicated castings if they have the foresight to plan on welding smaller cast sections together later. Here are some points to consider

By G. L. GIBSON
Project Engineer
Cooper Alloy Foundry Co.
Hillside, N. J.

FABRICATION of weldments from steel shapes and the growth of welding have been so closely associated with wrought steel that engineers and designers tend to feel that castings are not weldable.

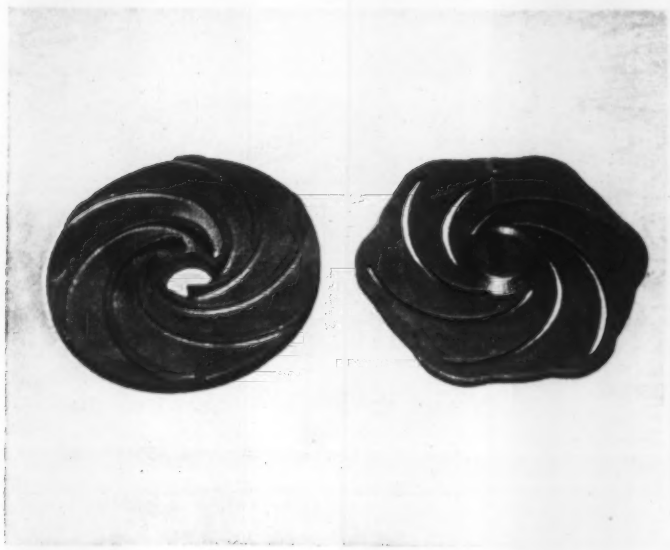
For this reason many fabricated products are designed with a multiplicity of welded details. A much neater and better product could be made if a casting were used in the complicated section, joined to the rest of the assembly by welding. But lack of understanding prevents designers from taking full advantage of cast-weld construction.

Close Kin—Welding and casting are actually closely related. In essence, welding is continuous casting of metal into a mold consisting of a beveled joint. Principal difference is that the weld is purposely fused with the mold, while in casting steps are taken to prevent that fusion.

Steel casting industry was probably the biggest single factor in the development of welding, for foundrymen have always been confronted with a few imperfections in an otherwise perfect casting. In fact, development of fusion welding arose from the need for the homogeneous repair of steel castings.

When To Weld—Process of making castings in sections and welding them together should be considered when:

1. There are still unfed hotspots after the designer has done



Left—Side view with vanes attached. Right—Underside of cover

Assembled view of cast-welded impeller wheel

everything to eliminate undesirable features, and after the molder has used up all available space with chills, gates and risers.

2. Large awkward coring can be eliminated or substantially reduced.

3. Long, relatively slender castings are required, several cast sections can be welded together. Same pattern can often be used for duplicate sections, shorter flasks are required, and dimensions and straightness are under better control.

4. Comparatively thin sections of large area are involved, a rolled plate section can be incorporated in the casting by welding; centerline shrinkage can thus be avoided.

5. Details in the nature of attachments which complicate the molding of the main section of the casting or drawing of a pattern, it is simpler to attach them later by welding.

Foundry personnel are often more aware of the quality and cost advantages and recommend changes in the original design. For this reason, design engineers should maintain close association with the foundry.

Where To Weld—Naturally, if there is any choice in locating the joint it should be where welding will be at a minimum. Type of joint and size of weld must be adequate from a stress standpoint but it is not economical or practical to make all joints look like part of the casting. Grinding for appearance sake is seldom practiced.

If there is a large duplication of pieces, a fixture should be utilized to facilitate part location without measuring. Some cast parts are naturally self-aligning, and the designer should incorporate such features if possible.

How To Weld—There is only one minor difference between weldability of castings and wrought material of the same analysis, and that is the effect obtained due to grain size.

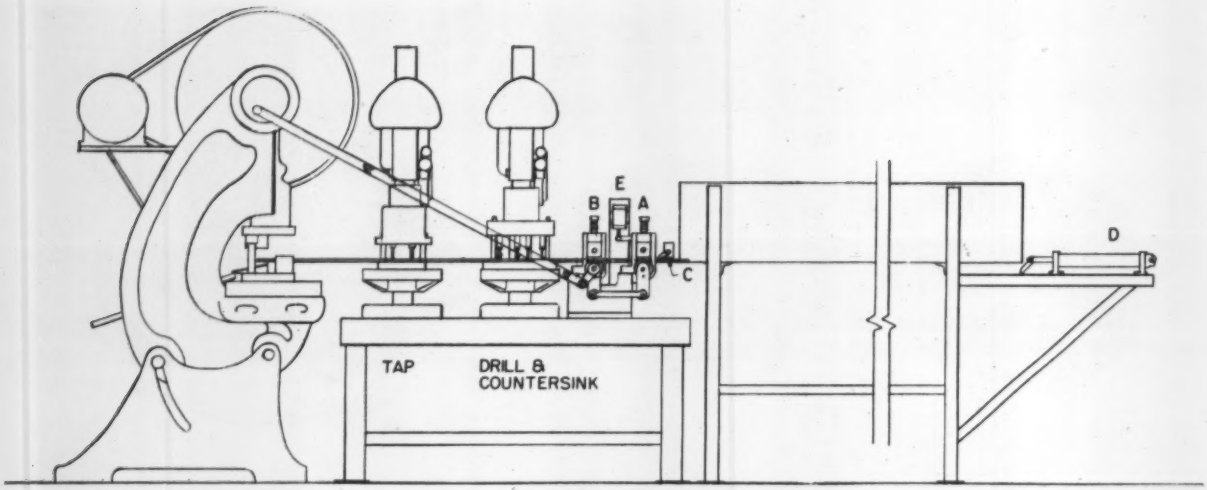
Large grain structure in certain austenitic and ferritic alloy steels makes them more susceptible to cracking during welding than the fine grain wrought chromium alloy. They can be welded but it is necessary to take greater precautions and use a restricted welding procedure.

Fillet welds require no special edge preparation but their size is important. Butt joints of two equal thicknesses should have complete penetration and be welded from both sides if possible. Bevel groove joints are most commonly used for butt welding; maximum depth of groove beveled from one side is ¾ inch. When thicker material is encountered, the joint should be beveled from both sides. Bevels on a casting may be cast or machined; the latter involves an extra step.

Automatic vs. Hand—The metal arc process with coated electrodes is the method usually used for welding stainless. Electrode manufacturers now offer 20 different alloy electrodes for chromium-nickel austenitic stainless steels and five alloys for straight chromium steels. These electrodes are designed to chemically match the standard grades of stainless.

Metal-arc welding is not suitable for automatic welding. When more than ten castings are involved and more than five pounds of weld per casting is required, automatic or semi-automatic welding should be considered. Method most suitable is the inert-gas-welded-metal-arc process.

In welding austenitic stainless steels for corrosion resisting applications, consideration must be given the phenomenon of intergranular corrosion. Except for the ELC grades and those stabilized with columbium or titanium, all weldments must be solution heat treated . . . water quenching from about 2000°F, the exact temperature depending on the alloy.



Vest-Pocket Automation

Combining several hand-operated jobs with an in-line feed mechanism is all it took to get the advantages of automation on this job. Total cost: Less than $3000

By FRANK M. BUTRICK JR.
Alma, Mich.

COST REDUCTION of nearly 90 per cent per part is the result of this small-scale automation. It's a case of improved efficiency on a low investment—practical tailoring of automation principles to a small operation.

Part is a piece of 8-gage cold rolled steel, ¾ x 1¾ inches, with two No. 10-24 holes. The part eventually is welded into an automotive stamping, where it replaces two weld nuts. Required production was 5000 pieces a day.

History — Four operations were formerly required. Stock is purchased in 12-foot lengths and sheared into ¾-inch-wide strips. Strips were then moved to another department where the stock was cut into 1¾-inch-long slugs by hand on an OBI press.

Drilling and tapping on two different single-spindle machines completed the part. Time for the original method, for operations after the shear, is listed below:

Cut to length	0.25	hour/1000 pcs.
Drill 2 holes	1.50	hours/1000 pcs.
Tap 2 holes	2.00	hours/1000 pcs.
Total time	3.75	hours/1000 pcs.

Lumped off at a total labor cost of $4.50 an hour, the part cost after shearing was $16.875 per 1000 pieces, or 1.7 cents each, for labor alone.

Cost Down—Since the operations were automated, using the original machines, a production of 2000 pieces an hour is maintained, and one operator is used where two had been required. The operator's sole duty is to supervise the operation, change tools, and keep the hopper full of stock.

New cost of the part is $2.25 per 1000. A 30-day supply is now run in 7½ working days, where before it was a two-man continuous operation. Cost of the entire system was less than $3000. All except the controls, switches, etc. was built by plant personnel.

Sequence — Stock goes from a hopper, holding a 30-minute supply of material, through feed rollers to the first station, where two holes are drilled and two previously-drilled holes are countersunk to assist subsequent tapping. From the tapping station the strip is advanced to a die where the part is cut from the drilled and tapped strip.

The die is a simple cutoff die in an OBI punch press. The tapping operation is performed by a 2-spindle tapping head in an air-feed equipped drill press. Drilling and countersinking are done in a similarly equipped drill press using a specially-designed 4-spindle head.

On the return stroke of the press ram, the stock is advanced 1¾ inches and the cycle repeats. Cutoff is done after the drills and taps are free of the work.

Feed—As the end of one piece of stock passes microswitch (C) the arm drops and feed rolls (A) are opened. Rolls (B) continue to feed.

As the rolls at (A) open, air cylinder (D) pushes a new piece of stock through the open rolls and up against the end of the preceeding strip. As stock stops, pressure builds up in the air cylinder, energizing a switch which closes rolls. Stock must be against the preceding strip to push it after it leaves the feed rolls.

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1904 • 1954

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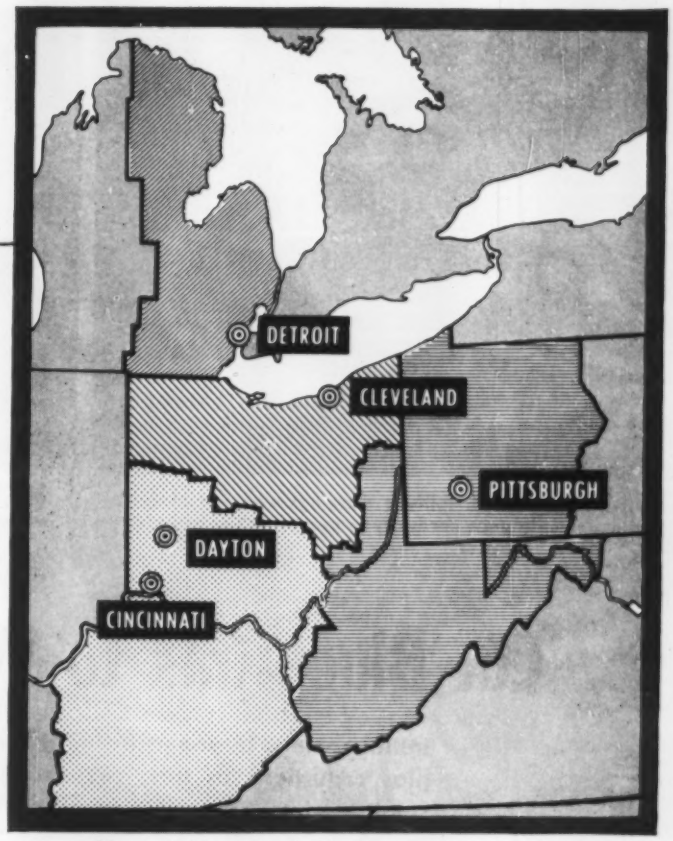

Motch & Merryweather's five offices are located in the heart of industrial America.

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  } *in area shown on map.*
- **AS *MANUFACTURERS* OF MACHINE TOOLS AND CUTTING TOOLS:**
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  Cutting Tool Manufacturing Division
  } *represented nationally by distributors.*
- **AS *REBUILDERS* OF MACHINE TOOLS:**
  Used Machinery and Rebuilding Division – *also nation-wide.*

The last fifty years have seen phenomenal progress in America and throughout the world. In those advances the machine tool industry has played a foremost role. Whatever contribution Motch & Merryweather has been privileged to make can only be an incentive toward continued effort in the same direction during the half century ahead. . . May we serve you?

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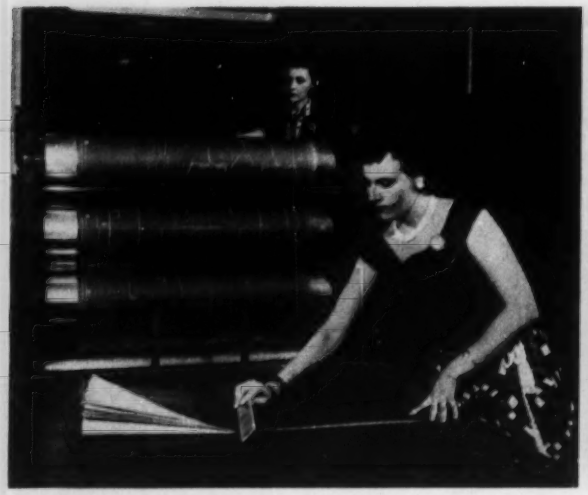

Folding blueprints of full-size drawings was one of three time-consuming steps necessary in preparing finished prints

Here, an operator uses a reduced-size photocopy to make two prints in same width of paper normally used for one

Cut Blueprints to Workable Size

Initial savings in paper, in filing space and shipping costs, plus reductions in time required to process and handle smaller prints, are some advantages North American reports

REDUCING its multitude of engineering drawings to one-quarter size photocopies makes a big difference in cost and convenience at North American Aviation Inc.

In addition to the obvious saving in paper, the aircraft builder reports reductions in time required to process and handle the smaller prints, in filing space and in shipping costs.

And size makes little difference in quality and legibility; both are excellent in the quarter-size reproductions made by continuous copying procedures.

Reducing Originals—The camera is used most effectively for reducing original roll drawings, which can be any length with maximum 42-inch width. Significance of the reduction technique is apparent when it is realized there may be thousands of drawings required for assembly of a jet fighter.

The Neo-Flo camera is a product of Peerless Photo Products Inc., Shoreham, L. I., N. Y. It makes copies of any original, whether drawn or printed on paper, vellum or other material. Reduction ratios go from 2 to 1 to 6 to 1, in right-reading or mirror-image copies on sensitized paper or film.

Processing—No darkroom is required for processing photocopies. An automatic daylight processing unit—with developing, quick-stop, fixing and washing tanks—is supplied with the camera. Exposed paper or film runs continuously through the four-tank unit onto a dryer, then is rewound on a spool or cut to size immediately.

Working from the smaller print, this assembly crew mounts the photocopy on a portable scroll, positioned at eye level

How far *was* Thirty Paces?

NOBODY knows, exactly. Back in the days of meetings on the "field of honor" neither the distances nor the weapons were very accurate. Land and buildings were sometimes "paced off" and even some phases of engineering followed the rule of thumb.

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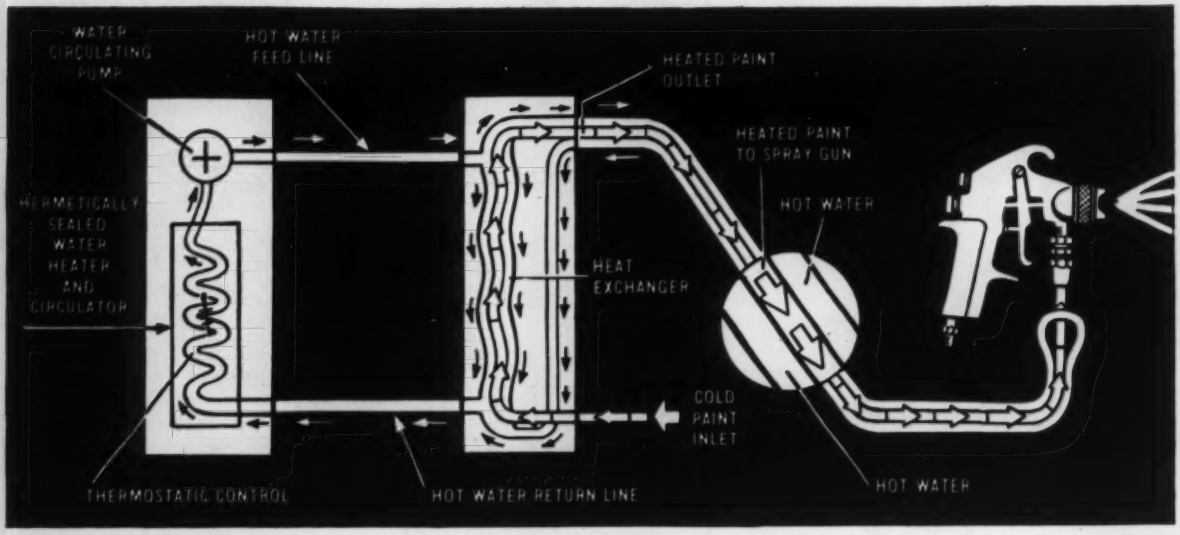
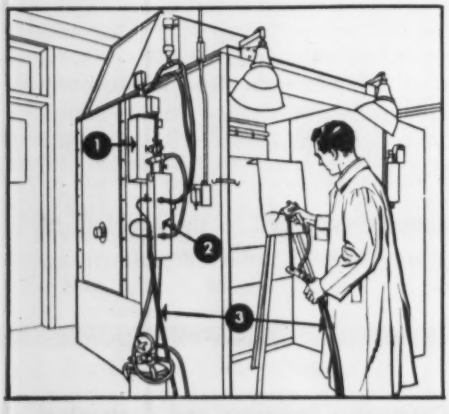


New DeVilbiss Paint Heater has three basic components: 1. Master Heater, 2. Heat Exchanger, 3. Heat Jacketed Hose Assembly.

New DeVilbiss Paint Heater offers you these advantages: no clogging, no overheating, no churning of paint, no variable fluid pressures. Adapts easily to multiple colors and spray stations. Safe, and easy to clean. Low in price. Your nearest DeVilbiss branch office can give you full details.



1. Water is heated and circulated by Master Heater. 2. Hot water heats paint in Heat Exchanger. 3. Paint is kept hot right up to the spray gun. Hot water circulates through supply-and-return passages in unique heat jacket surrounding hose.

From DeVilbiss . . . a fast, foolproof paint heater!

The new DeVilbiss Paint Heater gives you precision temperature and viscosity control! Paint can't char — there's no heater paint pump to wear out!

Now! DeVilbiss brings you a paint heater that's fast and foolproof . . . lets you take full advantage of the hot-spray method without paint overheating and constant maintenance.

Paint is heated to exact temperatures, almost instantly, in a revolutionary Heat Exchanger. Kept hot, too — right up to the gun — with an exclusive heat jacketed hose assembly . . . even with extended hose lengths.

If you'd like to enjoy the benefits of hot spraying — better finishes with fewer coats, less paint loss from overspray, no worries about variable room and paint temperatures which affect material viscosity — get complete details about the new DeVilbiss Paint Heater.

Call the nearest DeVilbiss branch office for full details or write us direct. Do it today!

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MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

MACHINE TOOLS are still bought and sold on the basis of what they will earn for the user. The clincher is almost always the ability of a machine to perform a given job in a given time at a given cost.

While this information can usually be figured out without ever leaving a desk, customers sometimes want to see the machine in the flesh. What's more they want to see it in action.

Builder Help—As a result the builders are going all out to make it possible for a customer to watch the machine run, to fiddle with the levers, and to generally give it a good, solid examination.

This is most often done by taking the prospective buyer into another plant in his area, and letting him see a similar machine at work.

Private Showings — Many builders now, however, have set up showrooms in their own plants. Machines are installed and are ready to run, often on a wide variety of jobs. Customers are invited to come in to observe and inspect the machines at their leisure.

Cost of some of these showrooms runs high. One of them has 15 machines. Including the cost of machine units, the room set this builder back $318,000. Operating expenses run to about $1000 a month. This can get even more expensive if a machine is tooled up specially to run trial on the customer's part.

Results — How much does this help sales? It's tough, at best, to trace the effect of any one factor on the total sales picture. Here's an example that might be indicative.

Cincinnati Lathe & Tool Co. has a traveling exhibit (The Magic Carpet) which is used to demonstrate their machines at the customer plant. Since it has been on the road, salesmen are closing 34 per cent more quotes than before. This experience is further evidence that customers like to see the machines making good on builder claims.

Shipments

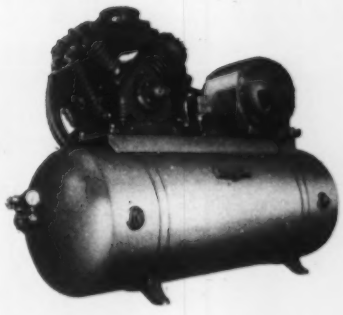
Machine tool shipments for the first half of 1954 totaled $538,350,000 as compared to $639,550,000 for the first half of 1953, and $551,650,000 for the second half of 1953.

The National Machine Tool Builders' Association points out that with foreign shipments in the first half of this year accounting for only 8.3 per cent of the total, and deliveries to government for national defense purposes substantially below those of last year, the 1954 figure indicates a high level of buying on the part of domestic users.

Milling Giant

Climaxing a replacement program of large machine tools at its Quincy, Mass., yard, Bethlehem Steel Co. has installed an 830,000 - pound milling machine.

Built by the Ingersoll Milling Machine Co., Rockford, Ill., the machine has a clear opening between housings of 14 feet, 8 inches and a 40-foot long table. Total horsepower required is 575. Shipment of the machine required 12 railroad cars.



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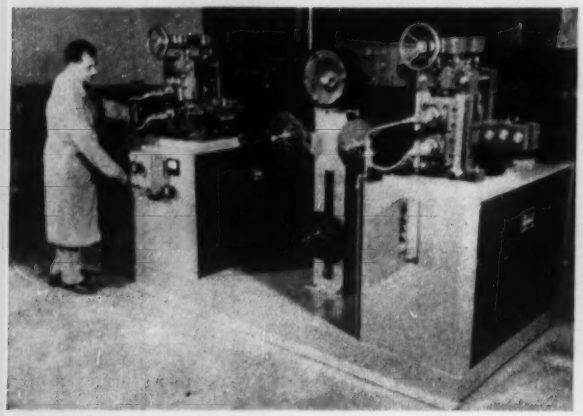
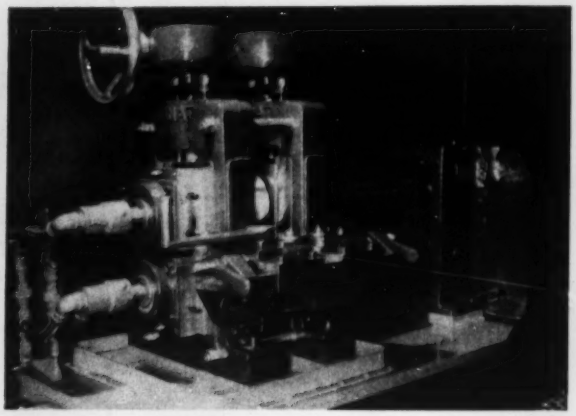




View at left shows compactness of a packaged tandem flattening mill. Close-up shows entry side of the mill stand and the vertical edger preceding it

WIRE FLATTENING . . .

A Lower-Cost Narrow Strip Producer

Growing demand for close-tolerance ribbon materials fosters new applications of tandem wire flattening mills. Package design throughout adds up to operating economy

By A. I. NUSSBAUM
Stanat Mfg. Co.
Long Island City, N. Y.

MANUFACTURERS of such precision products as hair springs, slide fasteners, resistance elements, suspension ribbons and electronic tube components are realizing that flat wire stock offers many advantages which cannot be obtained from ribbon stock slit from wide strip. To name only a few: Closer thickness and width tolerances, improved edge shape, reduced strip camber, smoother surface finish and availability of both traverse-wound spools and pancake-wound coils.

Wire flattening process is today being used in both the ferrous and nonferrous industries for the production of strip generally ranging in thickness from 0.001 inch to 3/16 inch and in width from 1/64 inch to 3/8 inch. Sections in excess of this width range are usually produced more economically by slitting wide strip.

Spreading Property—The fundamental metalworking principle underlying the wire flattening process is that of *spreading*—a property considered a nuisance by operating men in the strip and sheet rolling mills. Besides being elongated, strip metal is widened in the process of being reduced in thickness when passing between the rolls of a cold strip mill. In the rolling of wide strip, the effect of this spread is relatively unimportant. However, as the ratio of strip width to thickness decreases, the spread becomes more and more noticeable.

As this ratio reaches a value of 6 to 1 or less, the spread generally becomes so large that it has to be allowed for whenever the finished section is required to have a closely held width or when it is necessary to determine accurately the strip elongation resulting from a given pass reduction.

Basic Calculations—Two "rule-of-thumb" formulas have been found useful in wire flattening practice. The first one is used to calculate the diameter of round wire required to produce a given width and thickness of finished flat:

$$d = 0.5\ (b + h)$$

Where d = diameter of round wire, inches
b = width over-all of flat wire, inches
and h = thickness of flat wire, inches

This formula neglects the influence of the roll diameter and the material on the spread obtainable but, nevertheless, shows remarkably close results in all but extremely light gage work.

The second formula is used to determine the minimum roll diameter required to obtain a given amount of reduction in thickness in a single pass.

$$D = 80\ (d\text{-}h)$$

Where D = minimum diameter of rolls, inches
d = diameter of round wire, inches
and h = thickness of flat wire, inches

Wire Temper—In wire flattening, as in strip rolling, the percentage reduction in thickness, $(d\text{-}h)/d \times 100$, determines the temper

INTRICATE FORMING

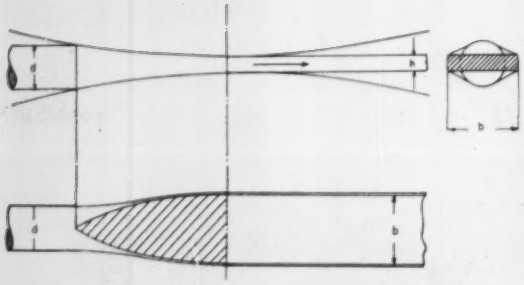
Weirton hot-rolled strip steel is the ideal material for forming intricate shapes. It has all the qualities that define *ductility*, meaning the ability to perform well in tough draws, deep draws, draws into all kinds of intricate shapes. Next time your plans call for a steel strip capable of the most complicated forming—call Weirton and be sure.

hot rolled strip steel from WEIRTON STEEL COMPANY

Weirton, West Virginia

WEIRTON STEEL COMPANY

NATIONAL STEEL CORPORATION



Above drawing indicates the basic distribution of spread in a single-pass reduction of round wire to a flat section between the rolls of a two-high mill

ASTM Thickness Reductions and B. & S. Numbers

Temper Designation	Hardness (B. & S. Numbers)	Thickness Reduction (per cent)
Annealed	0	0
Quarter hard	1	10.95
Half hard	2	20.70
Three-quarter hard	3	29.40
Hard	4	37.10
Extra Hard	6	50.15
Spring Hard	8	60.50
Extra Spring Hard	10	68.65

and, hence, the physical properties of the ultimate strip. Starting with annealed round wire, table shows the standard ASTM thickness reductions with the corresponding B. & S. gage numbers commonly employed in nonferrous metalworking practice.

To obtain the harder tempers of flat wire it may be necessary to draw the annealed round wire raw material through one or more dies prior to feeding into the flattening mill. On the other hand, if a relatively soft temper is required in the finished flat wire product, the stock often has to be annealed between passes through the flattening mill.

Wire Tolerances—The closeness of thickness and width tolerances obtainable from modern wire flattening mills is the major reason for their growing popularity. Thus, on 0.040 x ¼-inch cold rolled stainless steel *strip*, for example, the standard thickness tolerance is plus and minus 0.002 inch. However, *flat wire* of the same analysis is being produced with a standard thickness tolerance of only plus and minus 0.001 inch and can readily be held to plus and minus 0.0005 inch. Similarly, commercial width tolerances on *strip* of the above size are plus and minus 0.005 inch, while *flat wire* is being held to plus and minus 0.003 inch and closer.

The great and consistent accuracy of flattened wire products is facilitated mainly by the inherent precision of modern wire flattening mills and by the ready availability of close-tolerance starting round wire sizes. Thanks to the general use of tungsten carbide and diamond drawing dies, it is now possible for the operator of a wire flattening mill to obtain so-called "special" or "restricted" grades of round wires drawn to the following standard AISI size tolerances:

Wire Diameter (inch)	Tolerances Plus or Minus (inch)
0.500 and coarser	0.0015
0.4990 to 0.0760	0.0010
0.0759 to 0.0348	0.0005
0.0270 to 0.0151	0.0003
0.0150 to 0.0060	0.0002

Quality of such round wire stock compares favorably with that obtainable in re-roll strip materials and forms an ideal basis for the manufacture of close-tolerance ribbon stock.

Key Equipment — Majority of wire flattening mills built today are two or three-stand two-high units having roll diameters of 4 to 10 inches and speeds between 500 and 2000 fpm. In the case of three-stand mills, it is common practice to take the major reduction of the stock in the first stand, a somewhat smaller reduction in the second stand and a final slight size adjustment only in the third stand.

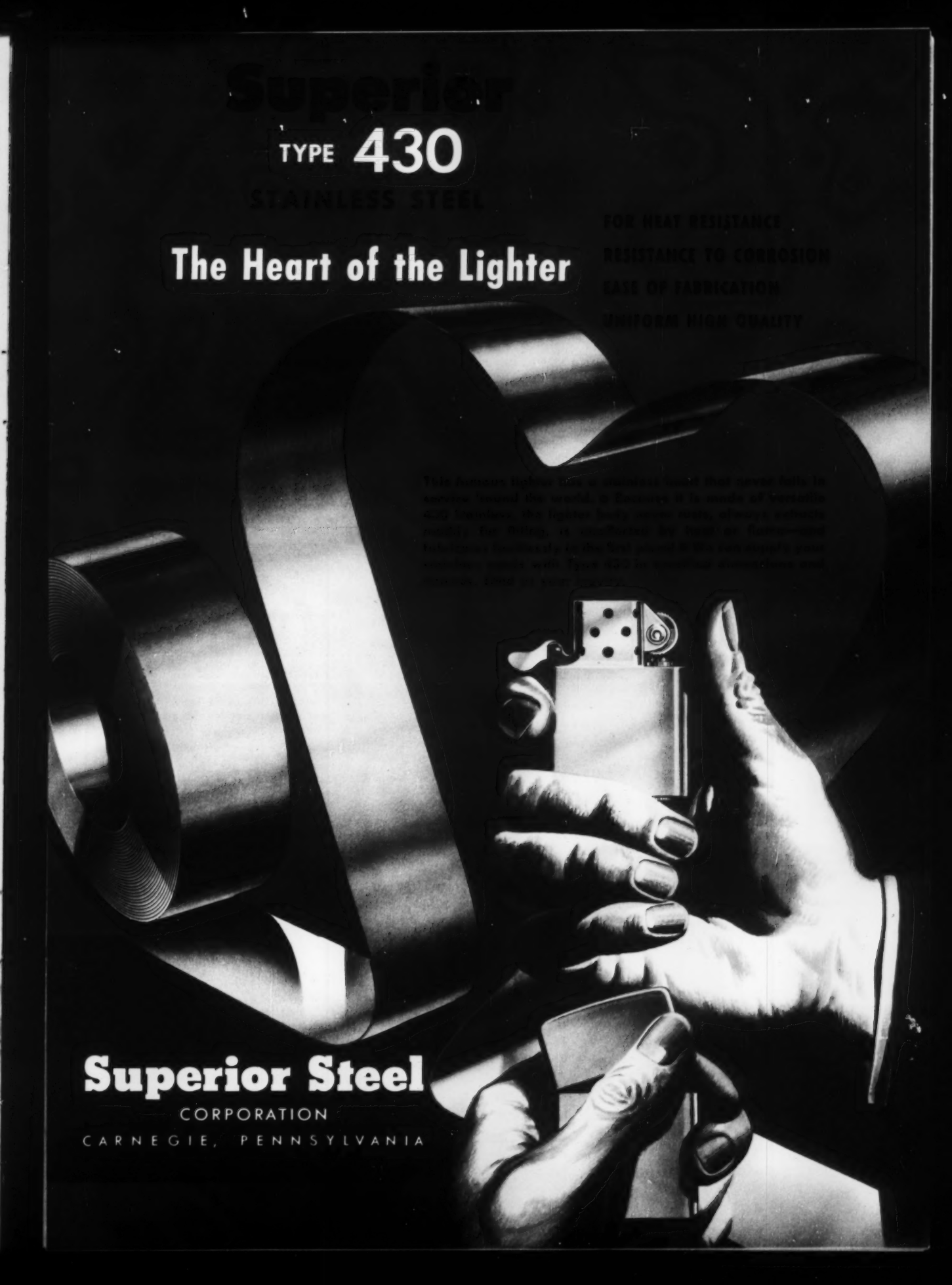
Probably the outstanding points in the construction of the up-to-date wire flattening mill are the use of:

(a) multiple mill stands mounted in tandem;
(b) universal spindle roll drives;
(c) anti-friction roll neck bearings;
(d) micrometer adjustment wormgear screwdowns;
(e) internally water-cooled rolls;
(f) rolls faced with cemented tungsten carbide rings;
(g) vertical edgers between mill stands;
(h) adjustable lay traversing take-up reels;
(i) extremely high and steplessly variable rolling speeds;
(j) electronic controls synchronizing the mill stands.

Tandems Vital—The early, slow method of feeding wire in successive passes through one and the same mill stand is today considered uneconomical, except for certain small-run specialty work. It was soon realized that greatly improved productivity could be obtained by mounting and operating two or more mill stands in tandem, but the major difficulty to be overcome in this respect was the synchronization of the mill.

With the growing acceptance of the Ward-Leonard variable speed drive in strip rolling mills, this type of drive also became more common in the field of wire flattening mills and today is without a doubt the most commonly adopted means of powering these machines. Whether two or five mill stands are involved, this dc drive furnishes perfect mill synchronization, stepless speed adjustment, controlled acceleration and deceleration and maintains tensions constant at whatever value selected.

Typical Unit — Accompanying photo shows a unit representative of modern two-stand tandem mill design. It has been installed at the plant of a prominent manufac-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The Heart of the Lighter
FOR HEAT RESISTANCE
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CORPORATION
CARNEGIE, PENNSYLVANIA

the new sealed GUIDEROL® BEARING BY McGILL

Without Increasing Overall Bearing Size this new SG series provides a single and double sealed bearing unit using a standard GUIDEROL bearing and built in commercial lip type seals. This new GUIDEROL bearing unit advantageously replaces ordinary needle type bearings requiring costly auxiliary sealing arrangements.

Installations are simplified and require less bearing space with corresponding savings in machining costs. Housings can be smaller and less complicated for bearings with shaft sizes ranging from ⅜" to 2".

Five different seal combinations provide versatility in handling sealing problems where the proven performance of GUIDEROL bearings can add capacity, dependability and longer life. Using the new complete unit eliminates the bother of separate bearing and seal sources.

Write today for the details on the first sealed unit that offers life-time lubrication for full-type roller bearings.

Write today for Bulletin SGR-54 on dimensions, shaft and housing fits and tolerances.

McGill Manufacturing Co., Inc.
301 N. Lafayette Street,
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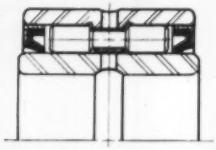
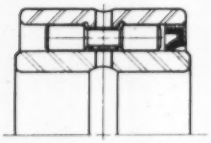
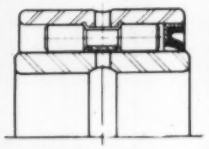
McGILL offers New Sealed GUIDEROL® bearing in 5 seal combinations.



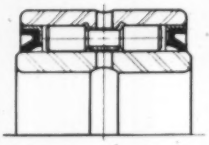
SS—Double seal, lips in. For lifetime retention of lubricant.



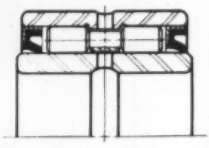
S—Single seal, lip in. Retain lubricant. Usually another sealed bearing at other end of shaft.



RS—Single seal, lip out. Used opposite another bearing to prevent entry of foreign material from one face.



RSS—Double seal, lips out. Prevents entry of foreign materials from both faces.



SRS—Double seal, one lip in, one lip out. For easy relubricating without displacing seal.

McGILL®
precision bearings

turer of slide fasteners and is being used in the flattening of carbon steel and copper-base alloy wires at high speeds.

A welded steel plate base encloses all piping and wiring and carries all the individual mill elements, thus assuring perfect alignment.

The round wire is uncoiled from a pay-off reel which may be equipped with an adjustable friction brake or electrical means of generating a drag effect. A nondriven roller straightener and an oiler is mounted at the entry side of the first mill stand, with the wire picking up the rolling lubricants as it passes through the oiler.

Sizing Pass—In cases of the commercially available round wire lacking the close diameter tolerances needed for the production of precision-sized flat wire, it is possible to mount a drawing die within the oiler attachment ahead of the No. 1 mill stand. In this manner, the round wire is given a slight sizing pass prior to entering the initial flattening pass. If it is desired to submit the round wire to a somewhat heavier draw, a capstan unit may be mounted between the die and the first mill stand in order to obtain sufficient drawing pull. Such an arrangement, however, requires a set of synchronizing dancer rolls to be mounted between the capstan and the No. 1 mill stand.

After flattening between the 6-inch diameter x 4-inch face rolls of the first stand, wire threads around the two fixed and one floating pulleys of the dancer roll stand and then reaches the No. 2 mill stand. In accordance with usual practice, the wire passes between the vertical rolls of an edging stand before entering the 6-inch diameter x 4-inch face width rolls of the second mill stand.

On leaving the final stand, the resulting flat wire size may be checked by a hand micrometer, or a continuous visual indication of wire thickness and width may be obtained by letting the stock pass between the gaging rollers of a set of "flying micrometers." Finally, the flat wire is spooled on a traversing take-up reel under conditions of adjustable tension and adjustable lay.

More Help With Metal Specs

YOU NEED all the help you can get these days to untangle metal specifications.

You can get it from the new revised cross-index of chemically equivalent specifications for steel and nonferrous alloys, just published by Department of Defense.

It's a 345-page reference book that defines and compares the compositions of all metal specifications. It will save you valuable production and engineering time by curbing confusion about the various specification systems.

Scope—Listed and cross-indexed are specifications of Army, Air Force, Navy, AISI, Dept. of Defense (MIL and JAN), ASTM, SAE, Aeronautical Standard Group, General Services Administration (Federal), Aeronautical Material (SAE) and Aluminum producers.

Metals included are iron and steel, copper, nickel, cobalt, titanium, lead, tin, silver, aluminum, magnesium, zinc, bismuth, cadmium, antimony, gold, platinum and their alloys.

Up-To-Date—The handbook is a revision of a previous cross-index completed late in 1952. A realization of the need of the metalworking industry for a complete rundown on metal specifications led STEEL to undertake publication of its Specifications Handbook based on the government's 1952 edition. Over 20,000 copies of STEEL's handbook were distributed, but the supply is exhausted; and because of revisions included in the new edition. it will not be republished.

How—To keep posted on the latest information on specifications, you can obtain copies of the new government handbook through STEEL's Readers' Service department, or from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Cost is $1.75 per copy, postpaid, payment with order.

When ordering from the Government Printing Office, ask for Supply and Logistics Handbook H 1A, "Cross-Index of Chemically Equivalent Specifications and Identification Code." When ordering through STEEL, use coupon below.

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Send me_____copies of the government's Cross-Index on metals specification at $1.75 per copy, postpaid. **Enclosed is my check for**_____.

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In enameling aluminum, Kawneer Co. fires its Zourite three times—once following pretreatment, then after enamel applications. A Lindberg electric box furnace fires the enamel

PORCELAIN ENAMELED ALUMINUM

Light Weight, ... Good Workability for the Fabricator

Aluminum enameling should show swift growth now that progress is being made on cost and production problems. Its durable, tough surface looks good on many applications

ALUMINUM'S sound structural qualities are being enhanced in many practical uses by vitreous enamels. The aluminum enameling process, subject to some production difficulties and plagued by high cost since development was announced in 1946, appears ready for significant growth.

It's estimated the product will command an annual market of 200 million pounds by 1970. While such demand represents important volume to the ceramic industry, it poses an equally impressive prospect for fabricators who will use the tough, lightweight material.

Durability — Enamel contributes durability. Long life and extremely low maintenance cost are both effected by the abrasion-resistant, hard, glassy surface structure.

Another result is improved resistance to corrosion, resistance to alkalis and milk acids. Enameled surfaces have shown no deterioration after 480 hours in a 20 per cent salt spray test. This factor broadens the potential of aluminum in marine applications and adapts it for construction in previously questionable areas.

Flexural Strength — Porcelain enamel gives aluminum rigidity and resistance to flexing—important in any structural material. Glass under compression is strong. Thus, in designing for enameled aluminum, strength of the glass under compression can be taken into consideration with the possibility of reducing metal thickness to offset additional weight of the enamel.

An average vitreous coating for aluminum weighs 10 grams per mil thickness per sq ft. So on a volume-weight basis, the enamel is only 1.4 times the average weight

PORCELAIN-ENAMELED ALUMINUM PROPERTIES

Durability—Hard, glassy structure establishes a surface that means long life, low maintenance.

Corrosion Resistance—It's impervious to salt water; protects against alkali, milk acids and outdoor exposure.

Strength—Aluminum takes on rigidity and resistance to flexing. For many applications, enamel coating on both faces of relatively light sheet stock imparts sufficient rigidity to allow substantial savings in base metal cost.

Fire Resistance—Although in certain applications excellent thermal conductivity of aluminum is desirable, on structural jobs the insulating value of glass contributes an important feature.

PORCELAIN-ENAMELED ALUMINUM IN CONSTRUCTION

Workability—Enameled aluminum can be sawed, cut, sheared, drilled or punched with little or no exposure of base metal. Raw edges show little corrosion with time, and enamel does not spall or erode from cut edge.

Spall-Resistance—The product is resistant to spalling or flaking off. If chipped or cracked, damage area will not enlarge. Since there is no disfiguring corrosion, repair is necessary only where damage is extreme.

Color and Surface Texture—Almost any degree of surface reflectivity, from very dull matte to extremely high gloss, can be obtained. Possible surface variations are innumerable. There is no limitation to the range of light-fast colors.

Thermal Shock-Resistance—Panels heated to 1000°F have been plunged into cold water with no cracking or flaking of the coating.

Added Flexural Strength—If additional strength is required, the metal can be subjected to heat treatment after coating to develop maximum base metal strength.

Dielectric Strength—The enamel has voltage breakdown rating of 500v per mil thickness, making it suitable for insulating and shielding.

Life—Although many lab tests have been conducted, only time can establish if there is a life limitation. Field installations in service for longer than 6 years are satisfactory in every respect and show no signs of deterioration.

Shipping Costs—Enameled aluminum requires no heavy wood crating; is commonly packed in lightweight fiber cartons. This means light gross weight, a substantial saving in shipping costs.

DEVELOPMENT OF USES

Porcelain-enameled aluminum already finds considerable acceptance in other than the construction industry for architectural siding. Among these are included:

Signs and Labels—Features color, light weight and durability.

Electric Shielding—Combines light weight of aluminum with high dielectric value of the enamel.

Appliances—Savings in fabrication of stoves, refrigerators, washers and dryers, plus a further attraction where shipping costs are important.

Others—Hardware and trim, dials and instruments, lighting fixtures, furniture, sanitary ware and transportation equipment, where weight is extremely important.

of aluminum. A typical example: If a 3-mil coating is added to the surface of 0.051-inch sheet aluminum stock, increase in total thickness is less than 6 per cent, and increase in weight is less than 10 per cent. But gain in flexural strength and resistance to surface denting is more than 60 per cent.

Workability—Some of the possible applications for the material become apparent upon examination of its capacity for workability. The product can be sawed, cut, sheared, drilled or punched with little or no exposure of the base metal. Raw edges show little corrosion with time, and the enamel does not spall or erode back from a cut edge. Minimum cost is achieved by using sheets of standard dimensions and fabricating them on the job.

Enameled stock of any thickness can be welded on the reverse side without discoloration or damage to the enameled surface. Enamel can be applied readily over welds without removing or grinding welded surfaces.

In the du Pont building, Wilmington, Del., the company recently installed a test office partition composed of panels of impregnated paper core laminated with 0.051-inch sheet aluminum and coated on the outside faces with 3 mils of porcelain enamel. Panels, purchased in standard 2 x 8-foot size, were cut to fit at time of installation. Enameled molding and trim came in standard lengths. The only out-of-the-ordinary equipment required for installation was a band saw blade with teeth designed for cutting aluminum.

Aluminum Stock—Ferro Corp., Cleveland, reports enamels may be applied to a fairly broad range of wrought aluminum alloys, extrusions and castings. The company specifies application to wrought 61S, 2S and 3S alloys and on nonporous 43 alloy castings. For extrusions, 53S, 62S and 63S can be used. Degree of metal's temper appears to be no factor in its enameling properties, although softer tempers are generally more suitable for forming operations.

For sheet work, alloy 61S is preferred. Copper and manganese content are critical; copper content should be less than 0.25 per cent. Alloy 2S and 3S are very pure, therefore have low strength and are very soft. Thus, it's impossible to subject these alloys to more than two enameling fires without getting a defect similar to hairlining. Enameling will affect original temper an undetermined amount.

Castings — According to Ferro, the best castings for porcelain enameling are permanent mold. Sand and die molds cause the most trouble. Die castings are subject to chill laminations in thin cross-sectional areas. Corners and edges should be rounded to a radius of not less than 1/32 inch. There is some distortion in thin, nonrigid sections which are enameled on only one side. However, these sections can be straightened by cold rolling without damaging the surface.

With cast alloys, it is essential that metal be free from porosity and sand holes to prevent local spalling. Any pores that communicate with the surface cause pinholes and minute spallmarks in the enamels.

Production, Costs—Since duPont completed the original development work on the aluminum enameling process in 1946 and Kawneer Corp. made the first applications under license, several production difficulties have been met. Chief among production problems is warpage of base metal during firing. Another, but more minor difficulty, has been color matching.

Economically, the high cost of raw materials—both the metal and the high-lead frit—is the most imposing present limitation to growth. However, development of leadless frits has been the subject of considerable intense research by several suppliers. Other firms have indicated interest in entering the field.

Summarized from a paper presented by Mr. B. C. Bricker, Electrochemicals Department, E. I. du Pont de Nemours & Co., at the spring Lead Industries Association meeting in New York.

INTERFERENCE MICROSCOPE

Operating on split beam principle, tool allows measurement of scratch depth by comparison to smooth surfaces

YOU CAN measure peaks and valleys ranging from two to 100 millionths of an inch with a new microscope in General Motors Corp.'s research laboratories.

Promises—Known as the interference microscope, it appears promising as a research tool and a quality control instrument where microscopic smoothness or roughness is important. Scientists say it adds the dimension of depth to the art of examining microscopic surfaces, a dimension ordinary microscopes cannot measure.

The optical interference principle is not new, but the industrial use of it on surface finish details of such minuteness is.

Telltale Pattern — An interference pattern is viewed through an eyepiece similar to that of a conventional microscope. Depth of scratches on a rough surface can be measured by their deviation from straight-line patterns obtained from smooth surfaces.

The microscope has been used to measure plating thickness, to determine leveling abilities of plating materials and to study effects made by weathering on painted surfaces.

It also has been used to control precision roughness standards of machined surfaces of bearings, cylinder walls, piston liners, valves and other highly-machined, close-fitting parts in automotive and aircraft engines. Another use has been to check corrosion pits and other defects on plated parts and other surfaces, such as cylinder bores and bearings.

MAGNETIC FATIGUE TESTER

Vibration frequency changes at a crack, halting machine for measurement. Fatigue resistance is important in design

RESEARCH into the endurance limits of steels makes it possible for engineers to design for loads within safe limits without excessive weight or waste.

One of the machines being used at U. S. Steel Corp.'s Research & Development Laboratory is a magnetic fatigue tester. Samples of steel from 24 to 36 inches long and up to 2 inches thick and 5 inches wide can be subjected to controlled vibrations at the natural frequency of the test piece.

The machine consists of two rubber-padded supports on which the test piece is placed, an electromagnet located at each end of the tester, pick-up coils located at the center of the sample, a power unit with controls, a stroboscopic light and a micro-comparator to measure vibration amplitudes.

Test Method—A piece of steel, which must be long enough to extend over the two end magnets, is placed on the rubber-padded supports, and the end magnets are positioned under the ends of the sample. An alternating current is supplied to the end magnets to set the steel vibrating, much after the fashion of a tuning fork. The amplitude of the sample's vibrations depends on the intensity of the current supplied to end magnets.

When a crack develops in the specimen, its natural vibrational frequency changes, upsetting the rhythm of impulses from pick-up coils to the power unit, and the machine automatically stops. By use of the micro-comparator, the amplitude of the vibration or amount of bending can be measured. Stroboscopic light establishes the location of small fatigue cracks in the material.

Results have been used on aircraft, bridges and other cyclic loading applications. Fatigue limits of steels with various surface finishes, welds, rivets, etc., also have been determined.

No Tube Mill is better than its Performance

Above: One out of three Yoder Tube Mills at Standard Steel Spring Co., Trenton, N. J. and Los Angeles, Cal.

Performance means production of good tubing, with minimum scrap losses, not only per hour or per day, but year in and year out. On this basis Yoder mills are most profitable in the long run.

Yoder mills have always been noted for their consistently high output, high weld strength and low scrap losses. Today, with the new Yoder 4-in-1 Cross-type Welding Transformer and other new features, their performance is more outstanding than ever.

And because most prospective buyers carefully investigate and compare performance records, there are more Yoder mills sold and in use than of all other electric resistance weld mills combined.

The Yoder Tube Mill Book tells the story of electric-weld tube making and answers many questions of interest to prospective tube mill owners. It's yours for the asking.

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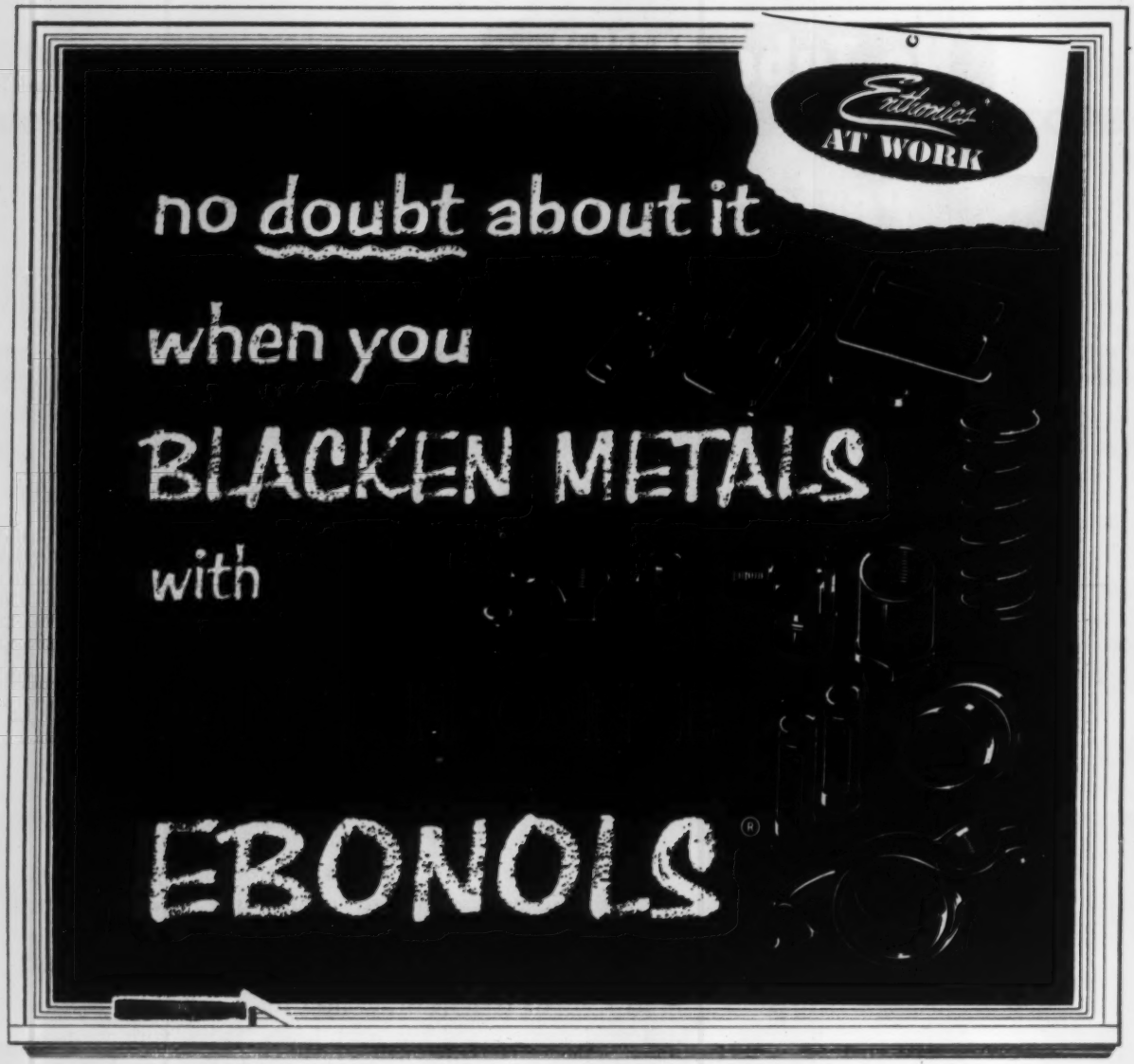

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EBONOL "S" produces jet-black oxide coatings. Simple and economical to operate. Operating temperatures: EBONOL "S", 285-290°F.; EBONOL "S-30", 295-305°F.

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EBONOL "C", the quality black for these metals, meets all military specifications.

For **ZINC**

EBONOL "Z" produces a durable, deep, rich finish for zinc plate or zinc alloy castings. Dull or glossy black oxide coatings are formed in from 5 to 10 minutes at 160-180°F.

EBONOL "Z-80", a blackening process for zinc and zinc alloys, operates at room temperature.

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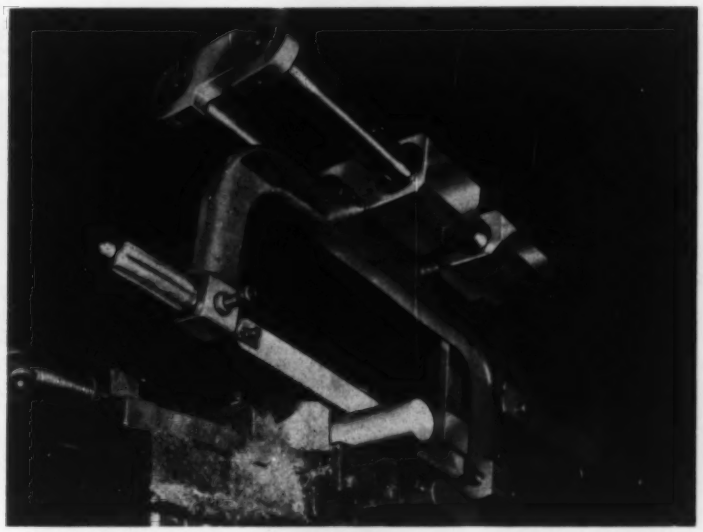

Closeup shows details of the Thompson saw after modification to incorporate antifriction bearing for linear motion

Ball Bushing Support Ups Saw Blade Life

Effect of improvised ball bushing application meant two to three times greater cutting speed, about four times longer hack saw blade life. Permanent modification resulted

ANTIFRICTION support of a reciprocating saw blade can work marked improvement in cutting rate, increase blade life and eliminate repair, adjustment and periodic lubrication.

This was the experience of Thompson Industries Inc., Manhasset, N. Y., after the company modified its tool room hack saw to cut down rate of blade replacement and up cutting speed. Effective modification followed other improvisations calculated to prevent frequent dulling of blades.

Ball Bushings—The somewhat crude modification that succeeded enabled the saw frame to be traversed on two 1½-inch-bore-diameter ball bushings, which the company itself manufactures. As a result, cutting rate was increased an estimated two to three times; blade life about four times.

Analysis of why the improvements were possible showed that sliding friction of the conventional design produced an intermittent cocking force that created a chatter. In service, gibs naturally wear due to sliding friction. This wear aggravates the chatter, which causes the saw blade to bounce along the piece being cut and produces intermittent gouging-tearing action.

Uniform Action—With the ball bushing-equipped saw, the blade appeared to give a smooth, uniform broaching action. Noise level was lower and vibration and chatter substantially reduced.

The almost frictionless ball bushings will not chatter because they cannot produce intermittent binding. They fit closely to their centerless ground shafts, give accurate guidance, and their free-rolling action eliminates wear due to friction. Almost all the saw's power goes into cutting the piece, since sliding friction of gibs is eliminated.

New Frame—In studying the application, Thompson's engineers concluded that the bearing arrangement in the improvised shop modification could be improved to give even greater cutting speed and blade life by redesigning rather than modifying the frame. A new frame design was developed using a single main guide rod mounting two ball bushings in tandem and a smaller anti-rotation guide rod mounting a single ball bushing.

New frame was rigid, inexpensive to manufacture. Guide rods, produced by centerless grinding, cost less to fabricate than adjustable gibs. Tandem bushing arrangement is preferred over a single bearing on each shaft because bearings are primarily resisting the saw's cocking action.

Bearing Mount—In the original modification, it was easier to mount the bearing on the saw frame, which meant they reciprocated with it. In the redesign, it was considered advantageous to mount bearings in the support arm, allowing saw frame guide rods to reciprocate through them. Thus, bearings are always centered directly over cutting load.

ANTISEP —the heavy-duty cutting base

When close tolerances are a must, you need

ANTISEP

When you're working to close tolerances, Antisep again proves it has the qualities that make it the leader in the field of cutting fluids.

This heavy-duty, fortified cutting base—soluble in water—provides greater lubricity and carries heat away faster than any cutting fluid you can match against it.

Tools stay sharper and last longer with Antisep. Work comes off with minimum distortion cool enough to handle barehanded. And Antisep also has topnotch anti-welding properties that mean freedom from chip build-up on the tool and better finish on the parts.

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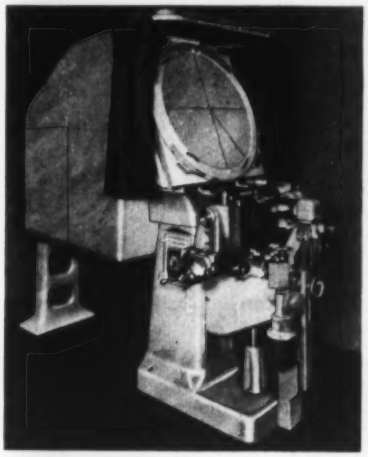
Optical Comparator

. . . for very heavy parts

A special 30-inch screen optical comparator for inspecting heavy parts has been built to rigid machine tool standards with milling machine type base and table.

A maximum 12-inch diameter and 20-inch length may be held between centers on a 42-inch table. A 32-inch table is available which allows parts 10-inches in over-all



length to be staged when using 12-inch diameter centers. Horizontal measurement is 16 inches; vertical measurement, 6 inches. Electrically controlled power elevation is added. Standard projection lenses from 10 to 100 magnifications are used according to job specifications. Jones & Lamson Machine Co.

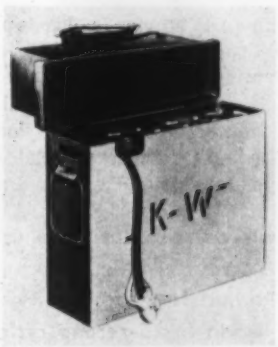
FOR MORE DATA CIRCLE REPLY CARD NO. 1

Power Unit

. . . mounted charger

Replacement battery of advantage to users of walkie-type powered lift trucks has a permanently-mounted charger. The battery remains on the truck and can be given a boost whenever truck is not in operation.

Charged by plugging into any



100-v, 60-cycle outlet, the charger can be left on without damage. Routine charging can be done overnight. Top tilts back with charger for easy access to battery for adding water. K-W Battery Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

Side Arm Machine

. . . fully automatic

A fully-automatic side arm type machine for electroplating or allied processing finishes supplements this company's line of automatic rack and barrel type plating and processing equipment.

The Stevadoer incorporates modern design features. It offers delayed set-down methods and improved safety features. Transfer method provides for automatic load and unload. Racks can be conveyed to load station of plant's automatic rack-type processing equipment, loaded, processed, unloaded and transferred to next manufacturing stage automatically. Frederic B. Stevens Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Oxy-acetylene Outfit

. . . for welding and cutting

A lightweight, fully-portable oxy-acetylene outfit in the low price range is introduced by Linde Air Products Co. Division.

The unit, for light-to-medium welding and cutting work, is called the Prest-O-Lite welding and cutting outfit and features an all-in-one blowpipe with interchangeable

welding and cutting tips. The same blowpipe heats, bends, solders, brazes, welds and cuts. No special attachments are necessary.

As furnished, outfit welds up to 3/16 inch and cuts through ¾ inch of solid steel. Union Carbide & Carbon Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Strapping Reel

. . . stands up under usage

An electrically-operated strapping reel is designed to save time and work in dispensing and cutting heavy-duty strapping.

Made to handle any size strapping from ¾ x 0.035 inch to 2 x 0.050 inch, model 430 Bulkbinder electric strapping reel is ideal for

use where strapping is cut to length. It is built to stand up under heavy usage and can be moved

on an ordinary hand truck. One man can control the entire unreeling and cutting operation. It operates on 110-v ac current. A. J. Gerrard & Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

Card File

. . . insulated against fire

A tabulating card file, said to greatly increase efficiency of machines and operators in all types of punched-card operations, houses 80,000 punched cards. It combines the push-up reference feature, positive locking of compression followers, easy tray stacking and trays-in-drawer principle.

Drawers have latches and labels on drawer fronts and tray fronts. The Safe-File affords certified insulated protection against fire. Remington Rand Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 6

Metering Loader

. . . no special installation

Miscellaneous small parts in quantities of 100 to 5000 pounds can be metered to any continuous appliance through use of a variable speed drive having a 20 to 1 variation. The leader can be made to distribute work evenly across full width of conveying mechanism in appliance being fed. It will handle parts as small as 1/16-inch thickness or diameter.

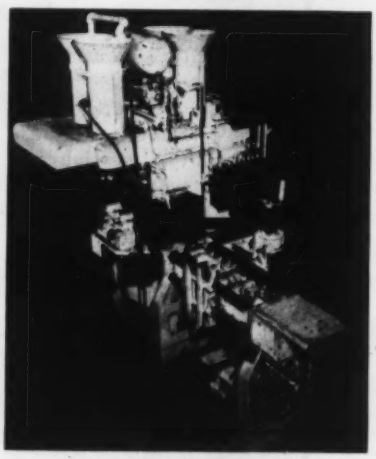
Standard hopper holds up to 1000 pounds of average size bolts weighing approximately 200 pounds per cu ft. No special installation is needed. The loader can be built to meet special conditions. Industrial Heating Equipment Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Production Tool

. . . works in 15-second cycle

The TR Cormatic, combining a high speed trunnion-type core rollover and draw machine with a Champion Blomatic core blower, has been designed by Beardsley & Piper Division to handle two core boxes on a roller-equipped frame that rotates around a trunnion axis.



As one box is rolled into TR Rol-A-Cor from the core blower, a blown core is drawn from the other box. Both boxes are rolled over. As the top box is automatically indexed into blower, clamped for blowing, finished etc., it is automatically indexed back to the TR Rol-A-Cor, and a blown core is drawn from the lower box. Pettibone Mulliken Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

Gearless Drill Heads

. . . for any hole pattern

An 800 series has been added to Zagar's line of standard gearless drill heads. Larger size spindles are incorporated to drill larger diameter holes. Spindles are up to 2½ inches in diameter

for drilling holes up to 1½ inches in diameter.

Holes can be drilled as close as the sum of any two hole diameters. Any hole pattern can be drilled, any number of holes can be drilled at one pass. All spindles rotate in the same direction and are noiseless. Spindles can be relocated to suit part changes. Head can be furnished with self-clamping drill jig. Zagar Tool Inc.

FOR MORE DATA CIRCLE RTPLY CARD NO. 9

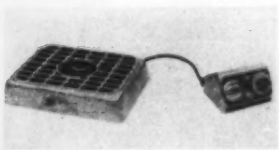
Weighing Equipment

. . . brief-case small

Up to 40,000 pounds can be weighed with equipment no larger than a briefcase. The Control Cells scale or weight indicator consists of a small platform containing an electronic weight sensing element and a separate portable dial cabinet connected to the platform by an electrical cable. Dial may be placed at the weighing

platform or installed for remote control.

Weighing is accomplished by



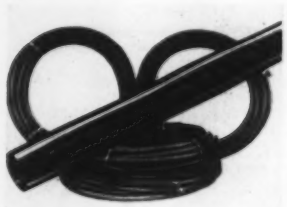
plugging in the scale at the nearest 110-volt outlet, or operation may be by battery. Control Cells Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Plastic Pipe

. . . usable above, below

Polyethylene-base flexible plastic pipe has been designed to eliminate deteriorating effect of sunlight. Chief advantage is it's a single type of nontoxic, noncontaminating flexible pipe usable in buried as well as above grade installations.



Additional features: Extremely low friction loss; no interior buildup; guaranteed against electrolytic corrosion, rust and rot; immunity to effects of corrosive waters, soils and a range of chemicals including most solvents. It is flexible enough to permit bending around obstacles without kinking. Munray Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

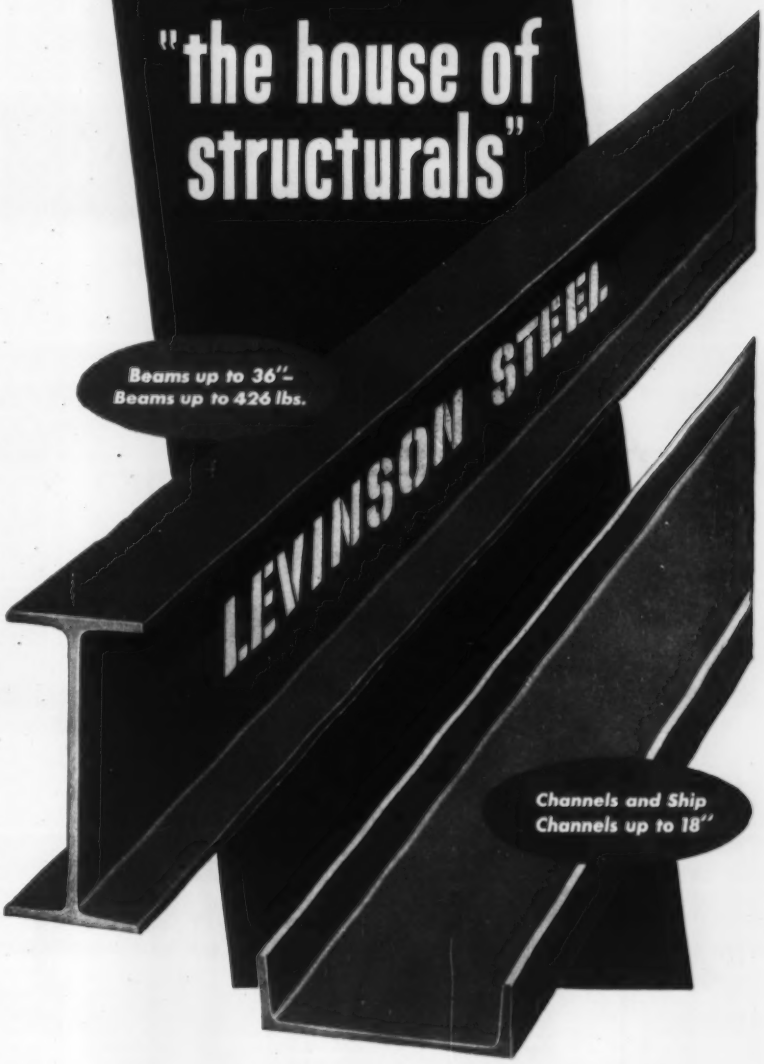
Grinders

. . . for heavy duty production

Type CX hydraulic surface grinders offer extra power and precision for heavy duty production. While massiveness is the keynote of construction, with heavy base and single column design, the grinder provides rapid removal of stock while maintaining close limits and fine finish.

Among the outstanding fea-

. . . they call us "the house of structurals"



We constantly get calls for extra large sizes in beams or channels . . . structurals that mills roll only two or three times a year can usually be found in Levinson stocks. Chances are we can take care of your inquiries, too. Since we always carry standard sizes in beams, angles, channels, plates, rounds, etc., you can buy to advantage in the larger weight brackets.

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41

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Central Ohio Warehouse
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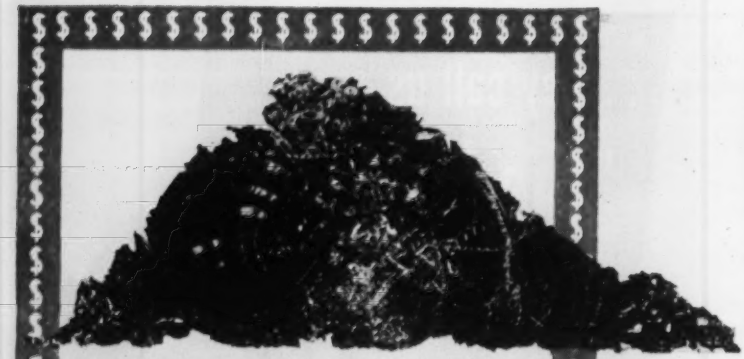
STEEL WAREHOUSE SERVICE



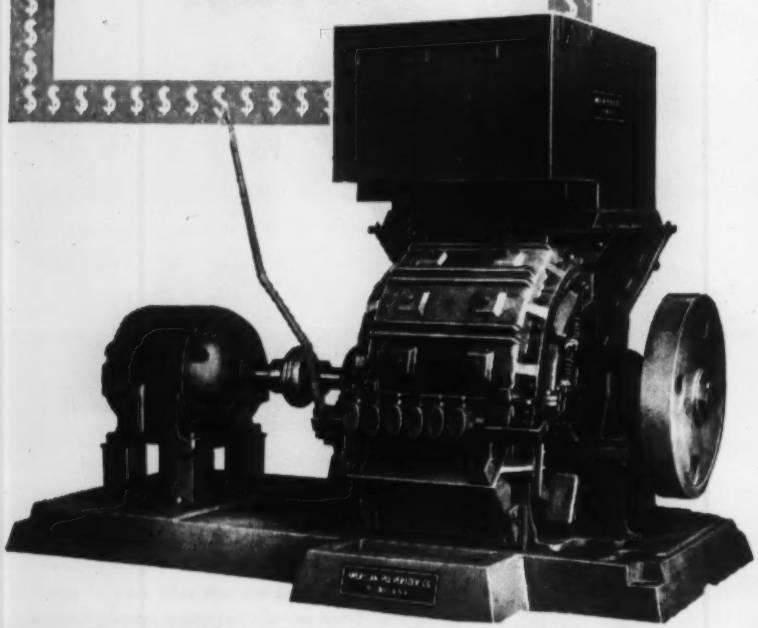
THERE ARE EXTRA DOLLARS IN THIS SCRAP PILE!

...when you install an

American

METAL TURNINGS

CRUSHER



Pays for itself in 3 Profitable Ways:

1. **TOP SCRAP VALUE.** Uniform short shoveling turnings produced by an American bring up to $4 per ton more than regular machine shop turnings.
2. **INCREASED CUTTING OIL RECOVERY.** Up to 50 gallons per ton are released from turnings reduced in an American.
3. **EASIER HANDLING, STORAGE.** American-reduced turnings require but a fraction of the usual storage space... are easily briquetted.

Available in 1 to 10 tons per hour capacities to meet your needs. WRITE today for the complete American profit story.

American

PULVERIZER COMPANY

Designers and Manufacturers of Ring Crushers and Pulverizers

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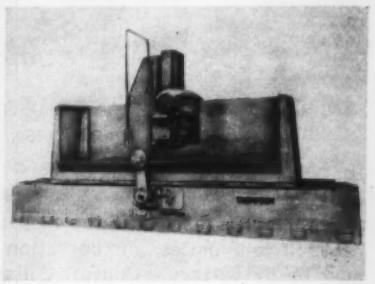
NEW PRODUCTS and equipment

tures: Cross feeding wheelhead with horizontal spindle grinding



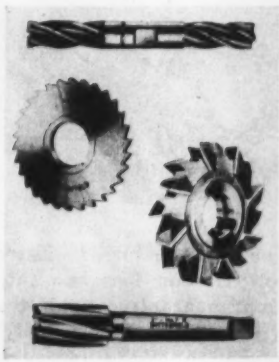
with the periphery of a 20-inch diameter wheel; rapid and accurate positioning of wheel to work; simplified, centralized control. Thompson Grinder Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Cutting Tools

. . . product line expanded

An addition to their line of cutting tools is announced by Butterfield Division.



A complete line of drills has been added, together with high speed counterbores and spot facers with interchangeable pilots. Union Twist Drill Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Load Grab Attachment

. . . for palletless handling

Diversification of load is said to be no problem with this hydraulic load grab attachment which permits palletless handling of all types of loads. Flexibility is made possible by spring-steel arm structure to accommodate to load shape, the application of selective grab pressures and the high-friction sur-

face on each pressure plate.

Arms of attachment are 28, 36 or 42 inches long and are ⅞-inch

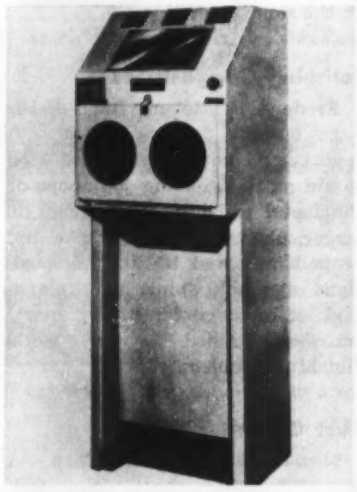
thick at tip, 1¾ inches at root on the 28-inch model. Thin arms allow for little loss of space between loads. Lewis - Shepard Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Wet-Blast Units

. . . no pumping mechanism

Addition of a low-cost model to Cro-Plate's line of pressure blast wet-blast units is announced. The Pressure Blast Jr. was designed



for multi-unit installation in the larger plant or smaller shop where compressed air supply may be low. It may be operated in conjunction with a 3-hp compressor.

It features: Motor-driven, pad-

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TOMORROW

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COMPLETE PLANTS designed, constructed, and equipped as an integrated unit for efficient and economical production.

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Write for Booklet No. 135

This booklet covers the scope of CONTINENTAL Service. It is well illustrated with views of CONTINENTAL installations with descriptions of the equipment and the processes performed.

9242

CONTINENTAL INDUSTRIAL ENGINEERS, INC.

176 W. Adams Street, Chicago 3, Illinois

DISTRICT REPRESENTATIVES

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dle type, agitator for water and abrasive mix; self-supporting trigger gun to reduce operator fatigue; foot pedal window wash actuator; large, single front work loading door with open end armports. Of special note is absence of pumping mechanism in blast circuit eliminating the problem of pump impaction and wear. Cro-Plate Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Pressure Gage

. . . checks at various points

Dillon pressure gage strip tension assembly provides a way of checking tension of strip at various points through several lines.

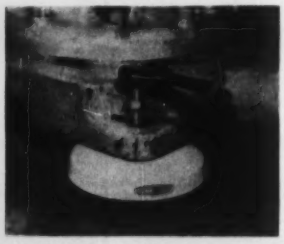
Instruments are available in nine ranges from 0 to 10 up to 0 to 5000 pounds, all with a warranted accuracy of 1 per cent ± indicated reading. W. C. Dillon & Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

Machinery Mounts

. . . for better accuracy

A larger Leveling Barrymount carries up to 10,000 pounds per mount. The LM7 allows heavy machinery to be installed and leveled in a matter of minutes, without bolting or shims.



Advantages: Low installation and maintenance costs; less wear and tear on adjacent machinery and plant structure itself; better accuracy; better working conditions; no more floor walking of heavy machines. Barry Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 17

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 125 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Induction Heating

Magnethermic Corp.—An 11-page catalog is designed to show their method of utilizing induction heating equipment for pre-heating metals. The publication demonstrates use of their equipment on brass, copper, magnesium, titanium, steel and other metals.

FOR A FREE COPY CIRCLE REPLY CARD NO. 18

Hand Threading Stainless

Babcock & Wilcox Co.—Tubular Products Division offers a folder for those confronted with the task of hand-threading stainless steel pipe. "Helpful Hints on Hand Threading Stainless Steel Pipe and Tubing" discusses die stock, dies, speed, cutting oils and assembly of threaded joints.

FOR A FREE COPY CIRCLE REPLY CARD NO. 19

Lubrication

Stewart-Warner Corp. — "Ask Anyone in Industry," written in comic-book style, points out the disadvantages of old-fashioned lubrication practices as opposed to centralized lubrication. Offered by Alemite Division, the booklet isn't catalogish.

FOR A FREE COPY CIRCLE REPLY CARD NO. 20

Construction Services

Dravo Corp.—"Dravo, Engineering Constructors," 54 pages, describes the services and activities offered by their Machinery Division construction department. Prepared as a photographic story, the book shows examples of projects. Introduction explains how the department's staff of engineering-construction specialists is equipped to complete a contract.

FOR A FREE COPY CIRCLE REPLY CARD NO. 21

Literature Index

Minneapolis - Honeywell Regulator Co.—Industrial Division offers Bulletin 100-C, which lists all current Honeywell literature. Numbers and titles of all catalogs, bulletins, specification sheets and instrumentation data sheets are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 22

Power Spray Washers

Peters-Dalton Inc. — Technical Bulletin No. 301, 16 pages, titled "Power Spray Washers," groups and discusses all types of power spray washers and their layouts and applications. 15 engineering drawings incorporate only essential features of a number of the most commonly-used types of washers.

FOR A FREE COPY CIRCLE REPLY CARD NO. 23

Tool Steels, Drill Rods

Uddeholm Co. of America Inc.—A wall chart, 13 x 22 inches, shows stock sizes of their flat ground tool steels and drill rods. Sizes for both types are included on the same side.

FOR A FREE COPY CIRCLE REPLY CARD NO. 24

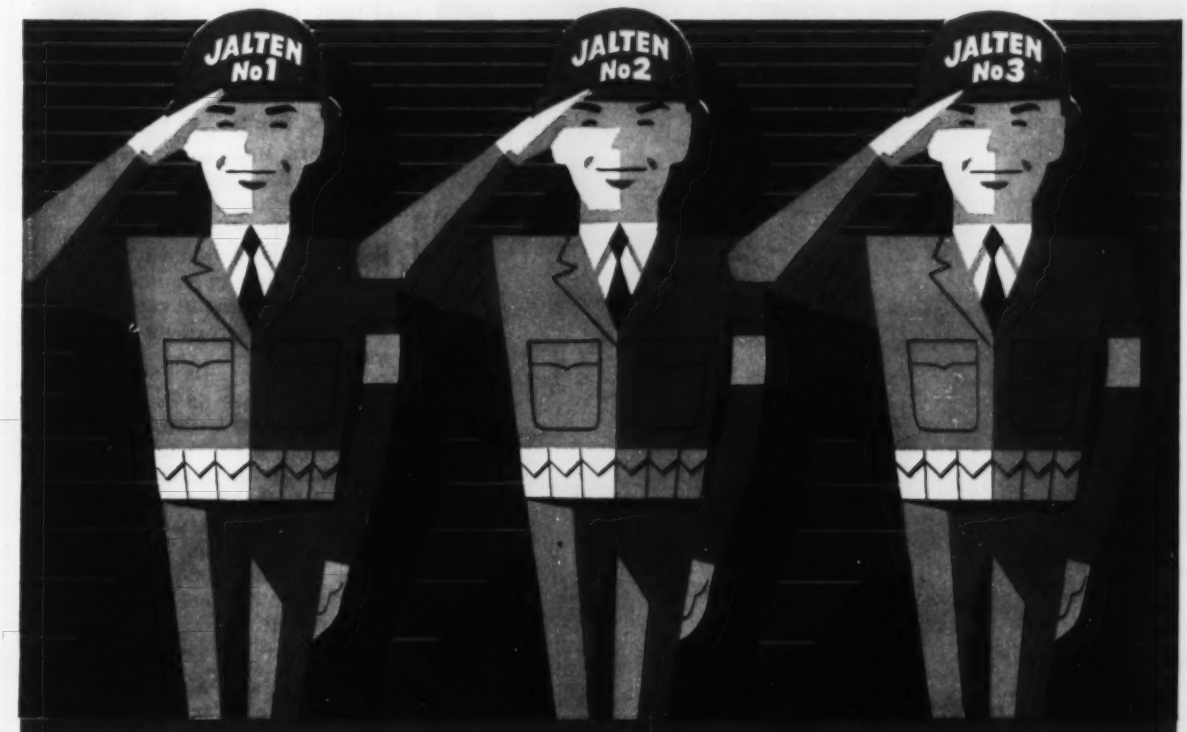
Polishing Compositions

Frederic B. Stevens Inc.—A 16-page bulletin features their L.V. reports and how they can be used to aid metal finishing job shops or the metal finishing department in larger plants. It presents a list of polishing and buffing compositions available, plus an explanation of how cost-cutting reports can be obtained for any metal finishing problem.

FOR A FREE COPY CIRCLE REPLY CARD NO. 25

Rust Chart

Nox-Rust Chemical Corp.—A rust-preventive chart, No. 954, lists those packaging and preservation materials which the company produces in conformance with various military specifications. Included are detailed properties of a number of products of



J&L's New JALTEN series enables you to select low-alloy, high-strength steel in the following combinations of advantages:

[redacted] High strength, good formability and fabricating —good resistance to low temperature impact.

[redacted] High strength, moderate forming—improved resistance to atmospheric corrosion.

[redacted] High strength—improved resistance to abrasion.

Remember to specify JALTEN High Tensile Steel for

- **HIGH STRENGTH • RESISTANCE TO CORROSION**
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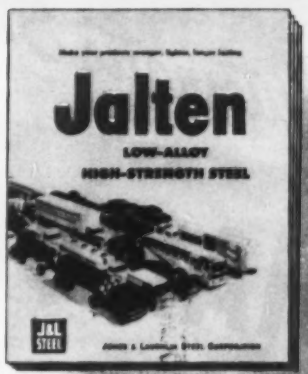
Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*



The data you want is in this book:

- Chemical Properties of Jalten
- Mechanical Properties of Jalten
- Jalten Equivalents
- Jalten Application Data

Jones & Laughlin Steel Corporation
Dept. 404, 3 Gateway Center, Pittsburgh 30, Pa.

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by HALLDEN
"the shearing specialists"
THE HALLDEN MACHINE COMPANY
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Sales Representatives
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T. E. Dodds (Non-Ferrous) Pittsburgh, Pa.
W. H. A. Robertson & Co., Ltd. (Ferrous & Non-Ferrous) Bedford, England

interest to firms doing industrial or military contract rustproofing operations.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Folders, Brakes

Niagara Machine & Tool Works —Descriptive literature on Niagara's new line of adjustable bar folders, air actuated to increase production while reducing operator fatigue, details operation and lists dimensions. Text is supplemented with many illustrations.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Pallet Truck

Lewis-Shepard Products Inc.— A circular describing their lightweight hydraulic pallet truck contains details of construction, engineering highlights and installation photos. Complete specifications of the 2000-pound-capacity hand truck are included in the 4-page folder.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Metalworking Paints

Flexrock Co.—"Paints for Metalworking Plants," lists a complete line of metalworking maintenance paints in 10 categories. Outlines cover where and how to use. Catalog indexing and layout are concise and clear for quick, easy reference.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Hollow Bar

Bethlehem Pacific Coast Steel Corp. — "BTR Hollow Bar" describes a new tool steel product developed by Bethlehem. The illustrated folder covers its application in manufacture of ring dies, draw rings, ring gages and other ring-type applications.

FOR A FREE COPY CIRCLE REPLY CARD NO. 30

Fastening Methods

Illinois Tool Works—Shakeproof Division offers "Fastening Forum," which includes further evidence of cost reduction with modern and ingenious fastening methods. Examples are given of a few of their thread-cutting screws and sems modified to fit a specific need in mass-production industries.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Production Ideas

Niles-Bement-Pond Co. — Pratt & Whitney Division offers a 23-page catalog, "34 Practical Production Ideas to Help You In-

USE A CARD

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crease Output and Reduce Costs." The booklet covers the automatic turret lathes manufactured by Potter & Johnston Co., a subsidiary.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Steel Catalog

Firth Sterling Inc.—Two steel catalog sheets have been released on C.Y.W. Choice and Type 420 stainless steel. Complete data as to typical analysis, characteristics, applications, forging, general heat treatment, annealing, hardening and tempering are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Photometer

American Instrument Co. Inc. —Bulletin 2252 covers high-vacuum coating evaporation, which applies thin coatings to various materials and measures coating thickness progressively as evaporation proceeds. Features and scope of use are covered. It incorporates schematic diagrams of the photomultiplier optical system and the vacuum system.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Industrial Pumps

Deming Co.—Industrial Catalog I-54, 108 pages, illustrated, describes practically every industrial pump made by this company. Contents of the catalog include information on construction features, performance and selection tables for the complete line. Several pages of information are related to liquid materials handling problems.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Gas-Fired Furnaces

Eclipse Fuel Engineering Co.—A 4-page brochure covers their gas-fired oven furnaces. Construction details, wall construction, hearth, burner equipment, special arrangements and dimensions are included. A schematic drawing details construction of oven furnaces.

FOR A FREE COPY CIRCLE REPLY CARD NO. 36

Metal Balers

Logemann Brothers Co. — Their self-contained, triple-compression metal balers are described in a 4-page illustrated folder. Operation, design, construction and optional features are covered. A second publication covers the Logemann double-compression balers.

FOR A FREE COPY CIRCLE REPLY CARD NO. 37

Gas Appliances

Johnson Gas Appliance Co.—Catalog No. 55, in color, illustrates and describes Johnson's line. Included are burners, furnaces for hardening, tempering and annealing, valves, torches, mixers, blowers and water warmers.

FOR A FREE COPY CIRCLE REPLY CARD NO. 38

Glass Products

Friedrich & Dimmock Inc.—A 16-page catalog, No. 53A, covers the company's line of glass products for industry. Included are complete application data tables which cover dimensions, weights, wall thicknesses and prices for glass tubing and rod, capillary tubes, low pressure gage glass tubes, oil cup glass cylinders and glass wool fiber used in filtration processes.

FOR A FREE COPY CIRCLE REPLY CARD NO. 39

Grommet Data

Goshen Rubber Co. Inc.—A 16-page brochure in handy file folder form lists sizes and types of grommets available. Schematic drawings of each type are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 40

Safe-Torque Driver

Scully-Jones & Co.—The 6-page "Precision Holding News," Vol. 2,

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

ARTICLE OR ADVERTISEMENT	PAGE

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

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2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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Readers Service Dept.

No. 1, covers their safe-torque driver, which is reported to prevent tap breakage. Torque setting, tap drivers available, torque adjustable to job, and a table giving approximate torque ratings for four-flute plug taps are included.

FOR A FREE COPY CIRCLE REPLY CARD NO. 41

Selenifiers, Controls

American Rectifier Corp.—A 12-page catalog on their line of selenifiers and controls for electroplating and metal finishing industries illustrates bench type and floor model selenifiers, supplies technical data and ratings on every type available in these classes.

FOR A FREE COPY CIRCLE REPLY CARD NO. 42

Electrical Failures

B. Eichwald & Co. Inc.—Symptoms and remedies for electrical failures in office and industry are illustrated in a 16-page brochure, "Electrical Operation Headaches —How to Cure Them and Profit."

FOR A FREE COPY CIRCLE REPLY CARD NO. 43

Rotary Table

Moore Special Tool Co. Inc. — Model No. 2 Moore 11-inch rotary table is described and illustrated in an 8-page, 4-color booklet. Interferometric inspection and calibration that assure accuracy of the table are explained.

FOR A FREE COPY CIRCLE REPLY CARD NO. 44

Mechanical Finishing

Hanson - Van Winkle - Munning Co.—New 4-page bulletin describes products and equipment used for mechanical metal finishing. It lists H-VW-M's line of standard buffs, composition, sisal buffs, brushes, polishing wheels, polishing and buffing lathes and accessories.

FOR A FREE COPY CIRCLE REPLY CARD NO. 45

Barrel Plating Equipment

George A. Stutz Mfg. Co.—Complete barrel plating equipment catalog for 1955 includes heavy-duty production barrels, single and multiple plating units, cylinder loading and unloading stands, alkali cleaning and rinsing units and portable plating barrels.

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Pressure System Protection

Frangible Discs Inc.—A series of catalog sheets covers the variety of uses offered in protection of pressure systems by frangible discs. The sheets, complete with diagrams and tabular material covering design and dimensions of the discs, are a handbook on pressure system protection.

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EDITORIAL REPRINTS:

Unionism Growing Up

Industry's relations with labor still are far from perfect, but there's evidence of improvement. One reason for the betterment is that labor is growing up. Abated is the rowdyism of the 1930's. Lessening is the federal influence. Growing is the mutual co-operation between management and labor for the public good. For an analysis of these trends, plus an interpretation of the areas in trade unionism that still need reform, see page 49.

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Control Incoming Materials

Biggest cost factor in a finished product is still probably tied up in materials. You can't afford a poor job of control—either of quality or identification of these purchased items. A pair of systems that work, assuring both quality control and rapid identification, are summarized on p. 92.

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Cast-Weld Construction

Designers need not rule out big, complicated castings says G. L. Gibson, project engineer, Cooper Alloy Foundry Co., if they have enough foresight to plan on welding smaller cast sections together later. On page 96 you'll find some of the points to consider.

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Coated Aluminum

Aluminum's sound structural qualities are being enhanced in many practical uses by vitreous enamels. The aluminum enameling process, described on page 110, poses an impressive prospect for fabricators who will use the tough, lightweight material.

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For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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Market Outlook

STEEL DEMAND is strengthening.

Here's proof: The steel ingot production rate rose last week for the first time in a month. A major steel producer which issues a weekly steel availability list began last week to quote slower delivery on cold-rolled sheets and strip, electrical sheets and coils and enameling iron sheets. Market reporters noted gains in ordering in various segments of the steel market. Optimism was growing among steel sellers.

TIME OUT— Labor Day will slow production but activity should resume in earnest next week. Vacations and holidays will be past.

Turning up for the first time in a month, the national steel ingot production rate gained two points in the week ended Sept. 5 and registered 64.5 per cent of capacity.

HOLIDAY SCHEDULES— With steel in relatively slow demand, producers feel no compulsion to operate on Labor Day. Some companies are stretching the long Labor Day week end several additional days. Wisconsin Steel Division of International Harvester Co., Chicago, will operate none of its finishing mills during the rest of the week of Sept. 6; its open hearths will be down until late that week.

SIGN OF PICKUP— The steel producer which lengthened delivery times on three groups of products is Inland Steel Co., Chicago. Delivery on cold-rolled sheets and strip, electrical sheets and coils and enameling iron sheets is quoted at five to six weeks. Delivery had been four weeks on cold-rolled sheets and strip and four to five weeks on electrical sheets and coils and enameling iron sheets. This is the first move in this direction in a long time; delivery times had been shrinking.

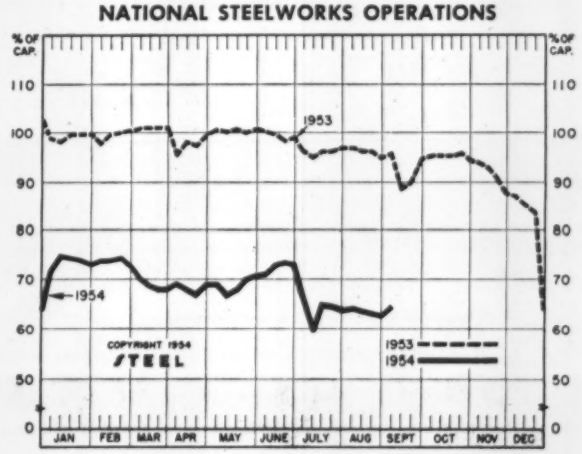
ACROSS THE BOARD— Other producers, too, saw demand picking up a little on various products. One producer of merchant steel bars is heartened by the business it is getting. That producer is operating at 82 per cent of capacity. Since automotive and farm implement requirements do not figure in the currently stronger bar business, barmakers find prospects encouraging. From fourth quarter on, automotive demand should be sizable; farm equipment outlook, however, is dim.

Plate producers continue to see order gains, although there is still much room for improvement. Warehouses continue to note an improved pace in business.

WATCH FOUNDRIES— One place to watch for the first signs of a strong upturn in business is foundries. They let their pig iron supplies get down to rock bottom because of slow business and quick deliveries on iron. Any business increase will send founders into the market quickly for iron.

TIN MILL PRICES RISE— Even though steel demand has considerable room for improvement the price structure continues to show strength. U. S. Steel Corp. announced that on Oct. 1 it will raise prices of tin plate, black plate, special coated manufacturing terne plate and holloware enameling black plate 10 cents a hundred pounds. Tin mill prices did not move up when other steel prices rose this summer. Tin mill prices are announced for six-month periods beginning Oct. 1 and Apr. 1.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Sept. 5	Change	Same Week 1953	Same Week 1952
Pittsburgh	65	+ 0.5*	94	98
Chicago	68.5	+ 2*	97.5	101.5
Mid-Atlantic	61	0	97	97
Youngstown	64	+ 1	106	106
Wheeling	70.5	0	96	95
Cleveland	61.5	+ 5	102.5	105
Buffalo	56	0	106.5	104.5
Birmingham	62	0	97	100
New England	51	— 1	83	90
Cincinnati	52.5	0	76.5	90
St. Louis	56	+ 9.5	95	76
Detroit	59.5	— 3	109.5	104
Western	78	+ 1	102.5	103
National Rate	64.5	+ 2	95.5	100

INGOT PRODUCTION‡

	Week Ended Sept. 5	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	96.1†	94.3	95.1	133.2
NET TONS (In thousands)	1,544†	1,515	1,527	2,140

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 41 Technical Outlook—p. 91

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Aug. 31 1954	Aug. 24 1954	Month Ago	Aug. Average
(1947-1949=100)	144.5	144.5	144.5	144.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Aug. 31

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.783
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	5.023
Bars, reinforcing	5.058
Bars, C.F., carbon	8.174
Bars, C.F., alloy	11.285
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.880
Sheets, C.R., carbon	5.871
Sheets, galvanized	7.140
Sheets, C.R., stainless, 302 (lb)	0.548
Sheets, electrical	9.350
Strip, C.R., carbon	$7.507
Strip, C.R., stainless, 430 (lb)	0.415
Strip, H.R., carbon	5.088
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.310
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin, plate, hot-dipped, 1.25 lb	8.433
Tin plate, electrolytic, 0.25 lb	7.133
Black plate, can making quality	6.233
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 1 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.19	194.19	194.19	189.38	152.90
Index in cents per lb	5.261	5.261	5.261	5.130	4.142

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.77	$117.77	$117.77	$115.56	$91.55
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	29.00	29.00	28.50	42.17	23.58

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 1 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., del. Philadelphia	4.55	4.55	4.55	5.302	3.816
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, del., Philadelphia	4.53	4.53	4.53	4.38	3.492
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.025	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45-5.95	4.275
Strip, C.R., Chicago	6.00	6.00	6.00	5.70	4.00
Strip, C.R., Detroit	5.60-5.90	5.60-5.90	5.60-5.90	5.45-6.05	4.20
Wire, Basic, Pitts.	5.75	5.75	5.75	5.475-5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.35-6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.675	4.675	4.675	4.525	3.40
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	49.66	49.66	59.66	60.75	49.39
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, del. Phila.	50.16	50.16	60.16	61.25	49.89
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	60.43	45.43
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$29.50	$29.50	$29.50	$44.50	$24.75
No. 1 Heavy Melt, E. Pa.	27.50	27.50	26.00	42.50	21.50
No. 1 Heavy Melt, Chicago	30.00	30.00	30.00	39.50	24.50
No. 1 Heavy Melt, Valley	30.50	30.50	29.50	42.50	25.25
No. 1 Heavy Melt, Cleve.	28.50	28.50	27.50	41.50	21.75
No. 1 Heavy Melt, Buffalo	26.50	26.50	26.50	42.50	26.25
Rails, Rerolling, Chicago	44.50	44.50	44.50	54.50	37.50
No. 1 Cast, Chicago	35.50	35.50	35.50	41.00	40.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$13.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

Daily Nonferrous Price Record

	Price Sept. 1	Last Change	Previous Price	Aug. Avg.	July Avg.	Sept. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	30.000	29.50
Lead	14.05	Aug. 25	13.80	13.846	13.800	13.540
Zinc	11.00	June 3	10.50	11.000	11.000	10.180
Tin	92.00	Sept. 1	92.50	93.332	96.562	82.410
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.119	21.500	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, del.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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Nonferrous Metals

Make the Western Hemisphere self-dependent in strategic materials, Senate group urges. Over 80 per cent of materials being stockpiled come from abroad, senator warns

Nonferrous Metal Prices, Pages 132 & 133

THE UNITED STATES can and should make the Western Hemisphere self-dependent in strategic materials.

So concludes Sen. George W. Malone (Rep., Nevada) and the subcommittee he heads under the committee on interior and insular affairs. It just completed an investigation of 75 strategic and critical materials needed for national security and economic expansion. The report is based on ten months of inquiry and 58 hearings.

Misplaced Reliance—In releasing the 415-page report, Senator Malone asserted that over 80 per cent of the materials being stockpiled come from Africa, Asia and other areas abroad. Warfare could cut off these materials, he pointed out, adding: "We must cease our misplaced reliance on these areas as sources of supplies of raw materials." Re-evaluation of foreign policy and revision of laws on international exchange of goods were among the dozen recommendations made.

Ex-President Herbert Hoover gave partial support to the subcommittee's findings. Based on his engineering experience, said Mr. Hoover, he believed hemispheric self-sufficiency was present or could be attained in such metals as aluminum, antimony, copper, chrome, iron, lead, manganese, molybdenum, nickel, titanium, tungsten, uranium and vanadium.

Undermined Acceptance—Opposition to the Malone report is already gathering. Observers point out that it contains many views expressed by the senator before the hearings began and that the hearings themselves were for the most part one-man shows. His record is against foreign aid and internationalism in foreign policy, whether Republican or Democratic. He consistently has opposed reciprocal trade in any form and championed interest of western miners. These factors, say government insiders privately, will undermine acceptance of the subcommittee's conclusions.

On Call: Lead and Zinc

First call is out for lead and zinc under the administration's ambitious new stockpiling order. Authority has been given General Services Administration to buy up to 300,000 tons of zinc and up to 200,000 tons of lead in this fiscal year. Producers have been asked to submit offers and tonnages they can sell for delivery Nov. 15.

This first offering is likely to involve heavier tonnages than the metals world suspects. GSA never announces in advance how much it will buy. An immediate jolt to the two industries is needed to perk up domestic production and miners. Congressional elections are not far away, and western congressmen know that mine welfare determines many votes. Economics play a part, too, and the psychological lift supplied by government buying is expected to stir buying and enhance prices. Already, lead has moved up a quarter-cent, and a significant draining of producers' stocks of either metal will bring further increases.

STEEL's Metal Price Averages for Aug., 1954

(Cents per pound)

Electrolytic Copper, del. Conn.	30.000
Lead, St. Louis	13.846
Prime Western Zinc, E. St. Louis	11.000
Straits Tin, New York	93.332
Primary Aluminum Ingots, del.	22.119
Magnesium, Freeport, Tex.	27.00
Nickel, f.o.b. refinery	60.000

Since June, when the stockpile buying started, over 40,000 tons of zinc and 25,000 tons of lead have been taken in. At least double that intake is anticipated in the next three months. The latest authorization does not mention monthly quotas for GSA to purchase. Any amount of the buying authority can be exercised in any month, and present conditions indicate heavy buying will come sooner rather than later.

Imports Lose Threat

Threat of imported copper and brass products is subsiding. Last year brass mills felt the competition strongly, but recovery in European consumption and harder selling here have eased the situation considerably. In the first half of 1954, brass rod and copper sheet and rolls imports were off sharply, but brass tube imports increased greatly. First-half figures show 8.2 million pounds of brass rod have come in as against 25.7 million pounds in record 1953. Copper rolls and sheets amounted to 4.4 million pounds in the first half, compared with 11.1 million pounds all last year and the high of 17.9 million pounds in 1950. Brass tube imports in the first half totaled 6.6 million pounds, close to the previous record year 1953 of 7.3 million pounds. Switzerland and the United Kingdom are chief rod suppliers, while West Germany leads in brass tube sales and Belgium-Luxembourg in sheet sales.

Alcoa Develops New Alloy

Superior mechanical properties at slight sacrifice in electrical conductivity over other aluminum conductor alloys is the advantage claimed for No. 2EC alloy, developed by Aluminum Co. of America. It's designed to meet high performance requirements of the electrical equipment manufacturing industry. Superior mechanical properties built into the new alloy include high yield strength and low creep.

Vacations Hit Magnesium

Magnesium wrought product shipments in July dropped 21 per cent from an excellent June as fabricators' vacations put the brake on new deliveries. Total shipments of extrusions, forgings, plate, sheet and strip in July were 516 tons. For the first time in many months, all classes of magnesium cast products moved up in June. Sand castings still dominate over permanent mold and die castings shipments.

Market Memos

- Kaiser Aluminum & Chemical Corp. settled with USA-CIO for a 5.4-cents-per-hour wage increase.
- Signed last week was a law continuing until next June 30 duty-free import of most types of scrap metal. Copper scrap duty has been suspended in a separate measure.
- Long-term copper strike fears diminished last week as copper companies and unions moved into near-accord.

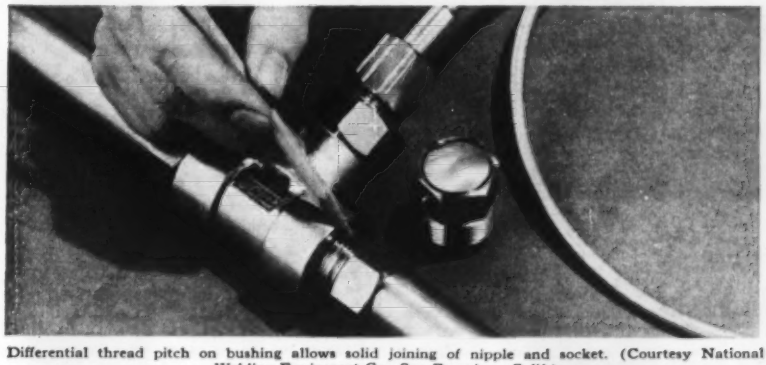
(Advertisement)

BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Quality Metals Control High-Pressure Gas



Differential thread pitch on bushing allows solid joining of nipple and socket. (Courtesy National Welding Equipment Co., San Francisco, Calif.)

High-pressure cylinder manifolds must be completely leakproof, especially when handling highly flammable or explosive gases, such as oxygen, hydrogen, or acetylene. One manifold achieves reliability and flexibility by combining a new design made of Bridgeport High I.Q. (Inner Quality) Brass.

The system includes a manifold socket, a nipple and a bushing. The socket and nipple are threaded to different pitch, while the bushing is threaded inside and out to match respectively the nipple and socket. To make a joint, the bushing is screwed onto the nipple, then screwed into the socket. The differential threading pitch will produce a positive high-pressure metal-to-metal seat inside the socket.

Backbone of the manifold system is Bridgeport high-strength metals. The manifold socket is forged from Bridgeport Brass Forging Rod (Alloy 133) for superior strength and toughness. The nipple is turned from Bridgeport Free-Turning Brass Rod (Alloy 6) for high-speed machining with minimum tool wear. And the bushing is made from Bridgeport Aluminum Silicon Bronze Rod (Alloy 707) for exceptionally high strength and corrosion resistance.

Bridgeport High I.Q. (Inner Quality) alloys are engineered for top performance in both fabrication and service. The next time you need an alloy for faster production, lower costs and longer service life, call on Bridgeport. Our Technical Service will be glad to help you select the right combination of strength, grain size, temper or machinability to improve your products.

Cold Heading Saves Metal, Cuts Cost

Cold heading can be a real money saver in producing precision metal parts. First, waste from cold forming is virtually zero compared to machining the same piece from solid stock. Second, many cold-headed parts can readily be used in the as-formed state since finishes are smooth and bright and tolerances are close.

For unusually high tolerances or slight changes of shape, machining is generally slight and such secondary operations as milling, slotting, drilling, tapping, threading or knurling can be done easily at high speeds ideal for mass production.

Third, cold-headed parts are usually made from metals specially produced for cold working, and the forming operation itself is a 100% check on quality. Any defect in the metal would show up quickly during upsetting. Finally, with sound metals cold forced into dies their grain structures closely follow the contour of the part, increasing its strength and resistance to vibration and shock.

Among the many Bridgeport alloys specially produced for cold heading is Bridgeport Yellow Brass (Alloy 16), often chosen for its double suitability to cold heading and machining. Bridgeport Silicon Bronze (Alloy 609) is recommended for cold forming bolts with exceptionally large heads. Its tensile strength runs up to 100,000 psi and its corrosion resistance is excellent. For extra-fine work, soap-drawn wire can be extruded to micrometer exactness.

Your plans for cold heading will hinge on selecting the alloys with the right combination of tensile strength, finish, grain size and temper.

And in selecting the right alloy—you'll find Bridgeport's Technical Service an invaluable help. Whether it's an alloy for cold-heading parts, brass for a band instrument or any one of hundreds of uses, Bridgeport's 89 years of metalworking experience and skill are always available to help you use metals to better advantage. Call our nearest sales office for prompt, dependable service on your metal needs.

Brass For The Band

Sheet brass helps put the oompa in a brass band. High-quality metal produces true pitch and tone. (Courtesy C. G. Conn, Ltd.)

Many a bright summer day has been brightened still more by the rollicking notes from a brass band. From trumpets to tubas, the proud parade of music-makers sounds its notes on horns made up from 654 different raw materials, of which fine sheet brass is by far the most important of them all.

The customary metal used for band horns is Low Brass, 80% (Bridgeport Alloy 5) furnished in 16 to 20 gage metal, usually of soft temper. Another alloy used for horn parts is Cartridge Brass (Bridgeport Alloy 37).

Just as the making of music and the instruments that produce it are arts, so too is the making of brass. That's why the skill and years of metalworking experience that go into Bridgeport Alloys enable them to meet the high standards of the instrument industry.

(1921)

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.00 del. Midwest; Lake 30.00 del; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.05, chemical 14.15, corroding 14.15, St. Louis; N.Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $293-$298, nom., per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.00.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb, f.o.b. shipping point; less than 1000 lb $5.10 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.00, brass special 11.25, intermediate 11.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.35, special high grade 12.50, die casting alloy ingot 15.00, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloy 20.75-21.25; No. 12 foundry alloy (No. 2 grade) 19.75-20.25; 5% silicon alloy, 0.60 Cu max., 23.25-23.50; 13 alloy, 0.60 Cu max., 23.25-23.50; 195 alloy 21.25-22.25; 108 alloy 20.25-20.75; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.00-21.50; grade 2, 20.00-20.50; grade 3, 19.00-19.50; grade 4, 18.00-18.50.

Brass Ingot: Red brass, No. 115, 27.00-28.50; tin bronze No. 225, 39.00-40.00; No. 245, 33.25-33.75; high-leaded tin bronze, No. 305, 31.50-33.00; No. 1 yellow, No. 405, 23.25-24.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $19.00 per cwt; pipe, full coils $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C. R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	...	60.0	...

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.2
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	34.7	38.9
5052-F	34.7	38.9
4S-F	35.7	40.6
5S2-F	37.4	42.4
61S-T6	38.6	43.0
24S-T4*	40.8	46.9
75S-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares. Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in., 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 13.00; low copper clippings 13.00; mixed clippings 11.00; old sheet 10.00; borings and turnings 6.00; pistons and struts 7.50; crankcases 10.00; industrial castings 10.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Munts Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 copper 23.00-23.25; light copper 21.00-21.25; No. 1 composition red brass 19.00-19.50; No. 1 composition turnings 18.50-19.00; mixed brass turnings 11.50-12.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 11.50-12.00; heavy yellow brass 14.00; new brass rod ends 16.00; auto radiators, unsweated 15.00; cocks and faucets 16.00-16.50; brass pipe 16.50-17.00.

Lead: Heavy 11.25-11.50; battery plate 6.00-6.25; linotype and stereotype 13.25; electrotype 11.75; mixed babbitt 12.25-12.50.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 4.75-5.00; new die cast scrap, 4.50-4.75; old die cast scrap, 3.00-3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.50-15.75; 51S, 52S clippings 15.25-15.75; 14S, 17S, 24S clippings 14.50-14.75; mixed clipping 14.00-14.50; old sheet 13.00-13.50; old cast 13.00-13.50; clean old cable, free of steel 15.00-15.75; borings and turnings 13.25-13.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper Brass: No. 1 copper 27.00-27.25; No. 2 copper 25.50-25.75; light copper 24.00-24.25; refinery brass (60% copper) per dry copper content 23.00-24.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 26.75-27.00; No. 2 copper 25.00-25.25; light copper 23.50-23.75; No. 1 composition borings 20.50; No. 1 composition solids 21.00-21.50; heavy yellow brass solids 17.00; yellow brass turnings 16.00; radiators 17.75-18.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.115; 200-499 lb $1.10; 500-999 lb $1.095; 1000 lb or more $1.09.

Zinc: Bar 18.50, bar or flat top 17.50 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,00 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

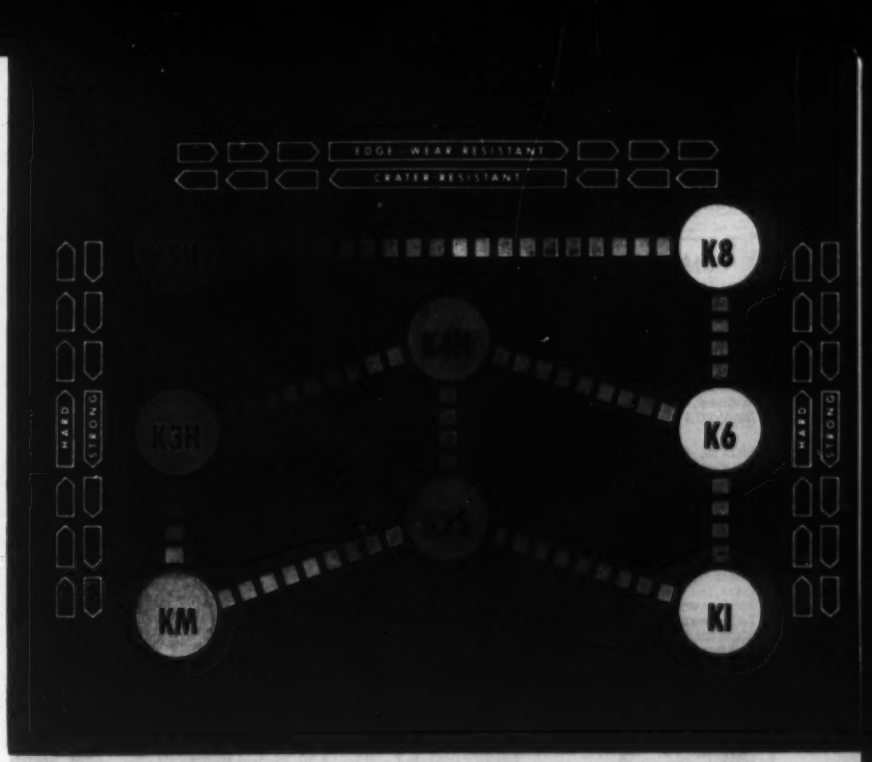
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71; 100-600 lb 56.7; 700-1900 lb 54.3; 2000-9900 lb 52.5; 10,000 lb or more 51.4.

Stannous Chloride: (Anhydrous): Less than 50 lb $1.57; 50 lb $1.23; 100-300 lb $1.08; 400-900 lb $1.055; 100-1900 lb $1.031; 2000-4900 lb 99.4; 5000-19,000 lb 99.3; 20,000 lb and over 87.2.

Stannous Sulphate: Less than 5 lb $1.269; 50 lb 96.9; 100-1900 lb 94.9; 2000 lb and over 92.9.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.



NOW- A Quick, Easy-to-Use Guide to Efficient Machining

Here's the first simplified system for selecting carbide tool grades. Kennametal's new grade selection method assures top tool performance on every machining job. It's easy to use and eliminates guesswork because grades are grouped according to their wear characteristics (edge-wear and crater-resistant); also according to relative strength with strong, intermediate and hard grades included in each group. These eight Kennametal grades meet all machining requirements.

Kennametal's grading system is unmatched in the industry for simplicity. Any experienced machinist can use it to quickly adjust grades for better tool performance. For example: If K3H is being used and crater is no problem, a switch to K4H, which is more edge-wear resistant, will provide longer tool life. Conversely, if K4H is being used and crater is excessive, a switch to K3H would improve tool life.

Your Kennametal representative will gladly help you apply this grade selection system to your machining operations. He can also help apply these eight grades to "wear spots" in your product, your processing lines, or any place a hard, wear-resistant metal is needed. Just give him a call. Kennametal Inc., Latrobe, Pa.

*Registered Trade Marks

KENNAMETAL
CEMENTED CARBIDE TOOLING THAT INCREASES PRODUCTIVITY

SALES OFFICES IN PRINCIPAL CITIES

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 135. Key to footnotes, page 137

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$66.00
Houston S5 .....73.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 .....64.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2 ..64.00
Munhall,Pa. U5 .....64.00
So.Chicago,Ill. R2,U5 ..64.00
So.Duquesne,Pa. U5 ..64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 ....78.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 ....78.00
Fontana, Calif. K1 ....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 ....78.00
Houston S5 .....85.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
Los Angeles B3 .....87.50
Munhall,Pa. U5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14 .78.00
So.Duquesne,Pa. U5 ..78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....88.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....93.00
Ind.Harbor,Ind. Y1 ..86.00
Johnstown,Pa. B2 ....86.00
Lackawanna,N.Y. B2..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14.86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ..96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 ....4.775
Munhall,Pa. U5 .....3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 ....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 ....4.675
Fontana,Calif. K1 ....5.475
Houston S5 .....5.075
IndianaHarbor,Ind. Y1 4.675
Johnstown,Pa. B2 ....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....5.015
Kokomo,Ind. C16 ....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ..5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 ....4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
SparrowsPoint,Md. B2 4.775
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7 ..4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 .....4.25
Bessemer,Ala T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gadsden,Ala (31) R2 ..4.28
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.65
Ind.Harbor,Ind. I-2 ....4.25
Johnstown, Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....3.95
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....3.95
So.Chicago,Ill. U5 ....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 ....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
FontanaCalif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah, C11 .....6.40
Houston S5 .....6.80
Ind.Harbor,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....7.00
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14.6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill U5 .....5.075

PLATES

PLATES, Carbon Steel

Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Buffalo(31) R2 .....4.255
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5 .....4.225
Cleveland(31) R2 .....4.285
Coatesville,Pa. L7 .....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.375
Fairfield,Ala. T2 .....4.225
Gadsden,Ala.(31) R2 ..4.255
Fontana,Calif.(30) K1.4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....3.975
Houston S5 .....4.625
Ind.Harbor,Ind. I-2, Y1 4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.40
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago,Ill.(31) R2..4.295
So. Chicago,Ill U5,W14..4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O.(31) R2 .....4.265
Weirton,W.Va. W6 ....4.225
Youngstown(31) R2 ....4.275
Youngstown U5, Y1 ..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.85
Ind.Harbor,Ind. I2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2...6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2..6.45
Youngstown U5, Y1.....6.45

PLATES, Alloy

Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....6.20
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BARS, Hot-Rolled Carbon

Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Buffalo(31) R2 .....4.33
Canton,O.(31) R2 .....4.46
Clairton,Pa. U5 .....4.30
Cleveland(31) R2 .....4.36
Ecorse,Mich. G5 .....4.45
Emeryville,Calif. J7 .....5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif.K1 .....5.00
Gary,Ind. U5 .....4.30
Gadsden,Ala.(31) R2 ...4.33
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Massillon,O.(31) R2 ....4.46
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.30
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23 ....5.05
So.Chicago(31) R2 ....4.37
So.Chicago U5, W14 ....4.30
So.Duquesne,Pa. U5 ....4.30
SoSanFran.,Calif. B3 ...5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. (31) R2 ....4.34
Weirton,W.Va. W6 .....4.30
Youngstown U5 .....4.30
Youngstown(31) R2 ....4.35

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ....5.075
Buffalo(31) R2 .....5.105
Canton,O. T7 .....5.075
Canton,O.(31) R2 .....5.115
Chicago(31) R2 .....5.145
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.175
Ecorse,Mich. G5 .....5.225
Fontana,Calif. K1 ....6.125
Fairless,Pa. U5 .....5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.475
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2..5.075
LosAngeles B3 .....6.125
Massillon,O.(31) R2 ...5.115
Midland,Pa. C18 .....5.075
So.Chicago U5, W14 ..5.075
So.Duquesne,Pa. U5 ..5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa, Pa. J5 .....6.45
Bessemer,Ala T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland(31) R2 .....6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.85
Ind.Harb.,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ...6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O.(31) R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
KansasCity S5 .....5.80
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
BeaversFalls,Pa.(31) R2..5.46
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 ....5.40
Detroit R7 .....5.55
Detroit B5, P17 .....5.60
Donora,Pa A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. (31) R2 .....5.47
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn.(31) R2 ..5.90
Harvey,Ill. B5 .....5.40
LosAngeles(31) R2 ....6.85
LosAngeles S30 .....6.85
Mansfield,Mass B5 ....5.95
Massillon,O. R8 .....5.40
Massillon,O.(31) R2 ....5.44
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
St.Louis,Mo. M5 .....5.70
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ...5.40

BARS, Cold-Finished Alloy (Turned and Ground)

Cumberland,Md.(5) C19.4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ...6.625
BeaverFalls,Pa. M12 ..6.625
BeaverFalls,Pa. R2 ...6.685
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 ....6.625
Detroit R7 .....6.725
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind.(31) R2 .....6.695
Hammond,Ind. L2, M13 6.625
Hartford,Conn.(31) R2.6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ...6.925
Massillon,O. R8 .....6.625
Massillon,O.(31) R2 ...6.665
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ..6.925
Youngstown F3, Y1 ...6.625

BARS, Reinforcing (fabricators)

Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo(31) R2 .....4.33
Cleveland(31) R2 .....4.36
Emeryville,Calif. J7 .....5.05
Fairfield,Ala, T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gadsden,Ala.(31) R2...4.33
Gary,Ind. U5 .....4.30
Houston S5 .....4.70

Ind.Harbor,Ind. I-2, Y1 4.30
Johnstown, Pa. B2 ..... 4.30
KansasCity,Mo. S5 .... 4.90
Lackawanna,N.Y. B2 .... 4.30
LosAngeles B3 ..... 5.00
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 .... 4.75
Niles,Calif. P1 ..... 4.85
Pittsburg,Calif. C11 .... 5.00
Pittsburgh J5 ..... 4.30
SandSprings,Okla. S5 .. 5.15
Seattle B3, N14, P23 .. 5.05
So.Chicago(31) R2 .... 4.37
So.Duquesne,Pa. U5 .... 4.30
So.SanFrancisco B3 .... 5.05
SparrowsPoint,Md. B2 .. 4.30
Sterling,Ill.(1) N15 .... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Youngstown U5 ..... 4.30
Youngstown(31) R2 .... 4.35

BARS, Reinforcing (Fabricated; to consumers)

Johnstown, ¼-1" B2 .. 5.70
KansasCity S5 ..... 6.50
LosAngeles B3 ..... 5.95
Marion, O. P11 ..... 5.55
Seattle B3, N14, P23 ... 6.15
So.SanFrancisco B3 .... 6.00
SparrowsPt. ½-1" B2.. 5.70
Williamsport,Pa. S19 .. 5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 ..... 4.25
ChicagoHts.(3) C2, I-2 4.20
ChicagoHts.(4) C2, I-2 4.30
Ft.Worth,Tex.(26) T4 .. 4.75
Franklin,Pa. (3) F5 .... 4.05
Franklin,Pa. (4) F5 .... 4.15
Marion,O.(3) P11 ..... 4.15
Moline,Ill.(3) R2 ..... 4.30
Tonawanda(3,4) B12 ... 4.30
Williamsport,Pa.(3) S19 4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 .. 10.85
McK.Rks.(D.R.) L5 .. 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Allenport,Pa. P7 ..... 4.05
Ashland,Ky.(8) A10 .... 4.05
Cleveland J5, R2 ..... 4.05
Conshohocken,Pa. A3 .. 4.10
Detroit(8) M1 ..... 4.20
Ecorse,Mich. G5 ..... 4.20
Fairfield,Ala. T2 ..... 4.05
Fairless,Pa. U5 ..... 4.10
Fontana,Calif. K1 ... 4.825
Gadsden,Ala. R2 ..... 4.05
Gary,Ind. U5 ..... 4.05
Geneva,Utah C11 ..... 4.15
GraniteCity,Ill. G4 .... 4.25
Houston S5 ..... 4.45
Ind.Harbor,Ind. I-2, Y1 4.05
Irvin,Pa. U5 ..... 4.05
Kokomo,Ind. C16 ..... 4.15
Lackawanna,N.Y. B2 .. 4.05
Mansfield,O. E6 (37) ... 4.05
Mansfield,O. E6 (38) ... 4.80
Munhall,Pa. U5 ..... 4.05
Newport,Ky. N9 ..... 4.05
Niles,O. N12 ..... 4.05
Pittsburg,Calif. C11 .... 4.75
Pittsburgh J5 ..... 4.05
Portsmouth,O. P12 ..... 4.05
Riverdale,Ill. A1 ..... 4.05
Sharon,Pa. S3 ..... 4.05
So.Chicago,Ill. W14 .... 4.05
SparrowsPoint,Md. B2 .. 4.05
Steubenville,O. W10 .... 4.05
Warren,O. R2 ..... 4.05
Weirton,W.Va. W6 .... 4.05
Youngstown U5, Y1 .... 4.05

SHEETS, H.R. (19 ga. lighter) High-Strength Low-Alloy

Gadsden,Ala. R2 ..... 5.35
Kokomo,Ind. C16 ..... 5.20
Niles,O. N12 ..... 4.95

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.10
Conshohocken,Pa. A3 .. 6.15
Ecorse,Mich. G5 ..... 6.25
Fairfield,Ala. T2 ..... 6.10
Fairless,Pa. U5 ..... 6.15
Fontana,Calif. K1 .... 6.875
Gary,Ind. U5 ..... 6.10
Ind.Harbor,Ind. I-2, Y1 6.10
Irvin,Pa. U5 ..... 6.10
Lackawanna(35) B2 .... 6.10
Munhall,Pa. U5 ..... 6.10
Pittsburgh J5 ..... 6.10
Sharon,Pa. S3 ..... 6.10
So.Chicago,Ill. U5 ..... 6.10
SparrowsPoint(36) B2 .. 6.10
Warren,O. R2 ..... 6.10
Weirton,W.Va. W6 .... 6.10
Youngstown U5, Y1 .... 6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 .... 4.30
Cleveland R2 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.30
Warren,O. R2 ..... 4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ..... 4.95
Cleveland J5, R2 ..... 4.95
Ecorse,Mich. G5 ..... 5.10
Fairfield,Ala. T2 ..... 4.95
Fairless,Pa. U5 ..... 5.00
Follansbee,W.Va. F4 ... 4.95
Fontana,Calif. K1 .... 6.05
Gary,Ind. U5 ..... 4.95
GraniteCity,Ill. G4 .... 5.15
Ind.Harbor,Ind. I-2, Y1 4.95
Irvin,Pa. U5 ..... 4.95
Lackawanna,N.Y. B2 .. 4.95
Middletown,O. A10 .... 4.95
Pittsburg,Calif. C11 .... 5.90
Pittsburgh J5 ..... 4.95
Portsmouth,O. P12 ..... 4.95
SparrowsPoint,Md. B2 .. 4.95
Steubenville,O. W10 .... 4.95
Warren,O. R2 ..... 4.95
Weirton,W.Va. W6 .... 4.95
Youngstown Y1 ..... 4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ..... 7.50
Ecorse,Mich. G5 ..... 7.65
Fairless,Pa. U5 ..... 7.55
Fontana,Calif. K1 .... 8.55
Gary,Ind. U5 ..... 7.50
IndianaHarbor,Ind. Y1.. 7.50
Irvin,Pa. U5 ..... 7.50
Lackawanna(37) B2 .. 7.50
Pittsburgh J5 ..... 7.50
SparrowsPoint(38) B2 .. 7.50
Warren,O. R2 ..... 7.50
Weirton,W.Va. W6 .... 7.50
Youngstown Y1 ..... 7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 ..... 5.55
Middletown,O. A10 .... 5.45
Warren,O. R2 ..... 5.55

SHEETS, Culvert (16 Ga.)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.25	7.10
Fairfield T2	6.25	6.50
Gary,Ind. U5	6.25	6.50
Ind.Harbor I-2	6.25	6.50
Irvin,Pa. U5	6.25	6.50
Kokomo,Ind. C16	6.35	....
MartinsFry.,O. W10	6.25	....
Newport,Ky. N9	6.25	6.50
Pitts.,Calif. C11	7.00	....
SparrowsPt. B2	6.25	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.75
Fairfield,Ala. T2	6.50
MartinsFerry,O. W10	6.50

SHEETS, Galvanized Steel Hot-dipped

Ashland,Ky. A10 ..... 5.45*
Butler,Pa. A10 ..... 5.45†
Canton,O. R2 ..... 5.45‡
Dover,O. R1 ..... 5.45‡
Fairfield,Ala. T2 ..... 5.45*
Gadsden,Ala. R2 ..... 5.45‡
Gary,Ind. U5 ..... 5.45*
GraniteCity,Ill. G4 .... 5.65‡
Ind.Harbor,Ind. I-2 .... 5.45†
Irvin,Pa. U5 ..... 5.45†
Kokomo,Ind. C16 ..... 5.55‡
MartinsFerry,O. W10 .. 5.45*
Middletown,O. A10 .... 5.45†
Newport,Ky. N9 ..... 5.45†
Niles,O. N12 ..... 5.45‡
Pittsburg,Calif. C11 .. 6.20‡
SparrowsPt.,Md. B2 .. 5.45‡
Steubenville,O. W10 .. 5.45‡
Weirton,W.Va. W6 .... 5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5 ..... 8.20
SparrowsPoint(39) B2 .. 8.20

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.85
Irvin,Pa. U5 ..... 5.85
Kokomo,Ind. C16 .... 5.95†
Newport,Ky. N9 ..... 6.00
Niles,O. N12 ..... 6.00

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 .... 5.70
Canton,O. R2 ..... 6.20

SHEETS, Galvanized Ingot Iron (Hot-dipped continuous)

Ashland,Ky. A10 ..... 5.70
Butler,Pa. A10 ..... 5.70
Middletown,O. A10 .... 5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 ..... 6.30
Niles,O.(28) R2 ..... 6.30
Weirton,W.Va. W6 .... 5.975

SHEETS, Aluminum Coated

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ... 5.375
Cleveland R2 ..... 5.375
Gary,Ind. U5 ..... 5.375
GraniteCity,Ill. G4 .... 5.575
Ind.Harbor,Ind. I-2 .... 5.375
Irvin,Pa. U5 ..... 5.375
Middletown,O. A10 .... 5.375
Niles,O. N12 ..... 5.375
Youngstown Y1 ..... 5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 .. 7.375
Follansbee(23) F4 ..... 6.60
Yorkville,O. W10 ..... 7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 ..... 5.85
Mansfield,O. E6 ..... 5.85
Middletown,O. A10 .... 5.85
Niles,O. N12 ..... 5.85
Weirton,W.Va. W6 .... 5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .... 6.25

SHEETS, Well Casing

Fontana,Calif. K1 .... 6.325

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Div., H. K. Porter Co. Inc.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Corp.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn.(10)S15 4.05
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3 ..4.175
Detroit M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 ....4.825
Gadsden,Ala.(27) R2 ...4.05
Gary,Ind. U5 .....4.05
Houston,Tex. S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
KansasCity,Mo.(9) S5 ..4.65
Lackw'na,N.Y.(25) B2..4.05
LosAngeles(25) B3 ....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 ....5.15
NewBritain(10) S15 ....4.05
N.Tonawanda,N.Y. B11.4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ....5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2 ..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5 .....4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....6.70
Houston,Tex. S5 .....7.10
KansasCity,Mo. S5 ....7.30
LosAngeles B3 .....7.90
NewBritn.,Conn.(10)S15 6.45
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5 .....6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ..5.95
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Houston S5 .....6.55
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 ....6.75
Lackawanna,N.Y. B2 ..6.15
LosAngeles(25) B3 ....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 ....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Bridgeport,Conn.(10)S15 5.75
Cleveland A7, J5 .....5.75
Dearborn,Mich. D3 ....5.90
Detroit D2, M1 .....5.90
Detroit P20 .....5.95
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.90
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 .....7.65
FranklinPark,Ill. T6 ...5.85
Ind.Harbor,Ind. I-2 ....6.00
Indianapolis C8 .....5.90
Lackawanna,N.Y. B2 ...5.75
LosAngeles C1 .....7.80
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ...5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ...6.50
NewHaven,Conn. D2 ....6.20
Pawtucket,R.I. R3 ....6.40
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 ....5.75
Sharon,Pa. S3 .....5.75
SparrowsPt, Md. B2 ...5.75
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....6.20
Warren,O. B9, R2, T5..5.75
Weirton,W.Va. W6 ....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 ....14.55
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 ....12.45
Mattapan,Mass. T6 ....12.80
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ...12.75
Youngstown C8 .....12.90

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15.	5.75	8.05	9.30	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	...	8.20	9.00	10.95	....
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15.	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pautucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	10.95	13.25
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7	6.60	8.35	9.30	11.45	14.15
Worcester,Mass. T6	6.30	8.35	9.30	11.45	14.15
Youngstown C8	...	8.05	9.00	10.95	13.25

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	12.85	15.35	18.35

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.75
Dover,O. G6 .....8.60
Ecorse,Mich. G5 .....8.75
Lackawanna,N.Y. B2 ..8.425
Pittsburgh J5 .....8.60
Sharon,Pa. S3 .....8.60
SparrowsPoint,Md. B2..8.425
Warren,O. R2 .....8.60
Weirton,W.Va. W6 ....8.60
Youngstown Y1 .....8.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.35

STRIP, Electrogalvanized

Dover,O. G6 .....5.75
Youngstown C8 .....5.75

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.775
Riverdale,Ill. A1 .....4.625
Sharon,Pa. S3 .....4.475
Youngstown U5 .....4.475

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric Motor		Dynamo
BeechBottom,W.Va W10	...	...	9.10	10.10	11.00
Brackenridge,Pa. A4	...	...	9.10	10.10	11.00
IndianaHarbor,Ind. I-2	8.025	8.50	9.10	10.10	....
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	...	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	...	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric Motor		Dynamo
Brackenridge,Pa. A4	...	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	...	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	...	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. ‡ Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. 1-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$6.50
Fairfield,Ala. T2 .....6.60
Fairless,Pa. U5 .....6.60
Gary,Ind. U5 .....6.50
GraniteCity,Ill. G4 .....6.70
Ind.Harbor,Ind. I-2, Y1.6.50
Irvin,Pa. U5 .....6.50
Niles,O. R2 .....6.50
Pittsburg,Calif. C11 ....7.25
Warren,O. R2 .....6.50
SparrowsPoint,Md. B2..6.60
Weirton,W.Va. W6 .....6.50
Yorkville,O. W10 .....6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4 ...6.10
Gary,Ind. U5 .....6.10
GraniteCity,Ill. G4 ....6.30
Ind.Harbor,Ind. Y1 ....6.10
Irvin,Pa. U5 .....6.10
Yorkville,O. W10 .....6.10

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2 .....$7.85
Gary,Ind. U5 .....7.75
Irvin,Pa. U5 .....7.75
Yorkville,O. W10 .....7.75

MANUFACTURING TERNES (Light coated, 6 lb)

Yorkville,O. W10 ....$8.65

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 .....9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..5.75
Aliquippa,Pa. J5 .....5.75
Alton,Ill. L1 .....5.925
Atlanta A11 .....5.95
Bartonville,Ill. K4 ....5.85
Buffalo W12 .....5.75
Chicago W13 .....5.75
Cleveland A7, C20 ....5.75
Crawfordsville,Ind. M8..5.85
Donora,Pa. A7 .....5.75
Duluth,Minn. A7 .....5.75
Fairfield,Ala. T2 .....5.75
Fostoria,O.(24) S1 ....5.95
Houston S5 .....6.15
Jacksonville,Fla. M8 ...6.27
Joliet,Ill. A7 .....5.75
KansasCity, Mo. S5 ....6.35
Kokomo,Ind. C16 .....5.85
LosAngeles B3 .....6.70
Minnequa,Colo. C10 ....6.00
Monessen,Pa. P7 .....5.75
Newark, 6-8 ga. I-1 ...6.40
No.Tonawanda B11 ....5.75
Palmer,Mass. W12 ....6.05
Pittsburg,Calif. C11 ....6.70
Portsmouth,O. P12 ....5.75
Rankin,Pa. A7 .....5.75
So.Chicago,Ill. R2 .....5.75
So.SanFrancisco C10 ....6.70
SparrowsPoint,Md. B2..5.85
Sterling,Ill.(1) N15 ....5.75
Sterling,Ill. N15 .....5.85
Struthers,O. Y1 .....5.75
Waukegan,Ill. A7 .....5.75
Worcester,Mass. A7 ....6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.375
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Cleveland A7 .....7.20
Donora,Pa. A7 .....7.20
Duluth,Minn. A7 .....7.20
Fostoria,O. S1 .....7.20
Johnstown,Pa. B2 .....7.20
LosAngeles B3 .....8.15
Millbury,Mass.(12) N6..7.50
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16...7.20
Muncie,Ind. I-7 .....7.40
Palmer,Mass. W12 ....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 ....7.20
Roebling,N.J. R5 .....7.50
So.Chicago,Ill. R2 .....7.20
So.SanFran. C10 .....8.15
SparrowsPt., Md. B2 ...7.30
Struthers,O. Y1 .....7.20
Trenton,N.J. A7 .....7.50
Waukegan,Ill. A7 .....7.20
Worcester A7, J4,T6, W12 7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.90
Alton,Ill. L1 .....7.075
Buffalo W12 .....6.90
Cleveland A7 .....6.90
Donora,Pa. A7 .....6.90
Duluth,Minn. A7 .....6.90
Johnstown,Pa. B2 .....6.90
KansasCity,Mo. S5 .....7.50
LosAngeles B3 .....7.85
Minnequa,Colo, C10 ...7.075
Monessen,Pa. P7, P16...6.90
NewHaven,Conn. A7 ...7.20
Palmer,Mass. W12 ....7.20
Pittsburg,Calif. C11 ...7.85
Portsmouth,O. P12 ....6.90
Roebling,N.J. R5 .....7.20
So.Chicago,Ill R2 .....6.90
So.SanFrancisco C10 ...7.85
SparrowsPoint,Md. B2..7.00
Trenton,N.J. A7 .....7.20
Waukegan,Ill. A7 .....6.90
Worcester,Mass. A7 ....7.20

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....11.375
Bartonville,Ill. K4 ....11.30
Buffalo W12 .....11.20
Chicago W13 .....10.55
Cleveland A7 .....11.20
Crawfordsville,Ind. M8.11.30
Fostoria,O. S1 .....11.20
Jacksonville,Fla. M8 ...11.73
Johnstown,Pa. B2 ....11.20
Kokomo,Ind. C16 .....11.20
Minnequa,Colo. C10 ...10.95
Monessen, Pa. P16 ....11.20
Muncie, Ind. I-7 .....11.40
Palmer,Mass. W12 ....11.50
Roebling,N.J. R5 ....11.50
So.SanFrancisco C10 ..11.55
Waukegan,Ill. A7 .....11.20
Worcester,Mass. A7,T6.11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 ....9.90
Buffalo W12 .....9.90
Johnstown,Pa. B2 .....9.90
Minnequa,Colo. C10 ...10.025
Monessen,Pa. P16 .....9.90
Muncie,Ind. I-7 .....10.10
Portsmouth,O. D2 .....9.90
Roebling,N.J. R5 .....10.20
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE (A)

Alton,Ill. L1 .....9.45
Bartonville,Ill. K4 .....9.35
Buffalo W12 .....9.35
Fostoria,O. S1 .....9.75
Johnstown,Pa. B2 .....9.75
Monessen,Pa. P7 .....9.35
Monessen,Pa. P16 .....9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....9.65
Portsmouth,O. P12 ....9.35
Roebling,N.J. R5 .....10.05
SparrowsPt. B2 .....9.85
Struthers,O. Y1 .....9.75
Worcester J4, T6 .....8.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton, Ill. L1 .....12.75
Bartonville, Ill. K4 ....13.25
Monessen, Pa. P16 ....13.15
Portsmouth, O. P12 ....13.15
Roebling, N.J. R5 .....13.45

WIRE, Cold-Rolled Flat

Anderson, Ind. G6 .....7.95
Baltimore T6 .....8.25
Buffalo W12 .....7.95
Cleveland A7 .....7.95
Crawfordsville, Ind. M8 .8.05
Dover, O. G6 .....7.95
Fostoria, O. S1 .....7.95
Kokomo, Ind. C16 .....8.05
Franklin Park, Ill T6 ..8.05
Massillon, O. R8 .....7.95
Monessen, Pa. P7, P16..7.95
Pawtkt., R.I. N8 .....8.25
Rome, N.Y. (32) R6 ....7.95
Trenton, N.J. R5 .....8.25
Worcester A7, T6, W12.8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
Ala. City, Ala. R2	6.90 7.30**
Aliquippa J5	...6.90 7.425‖
Atlanta A11	....7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	.....6.90 7.30†
Cleveland A7	....6.90 ....
Crawfordsville M8	7.00 7.55
Donora, Pa. A7	...6.90 7.30†
Duluth, Minn. A7	..6.90 7.30†
Fairfield T2	.....6.90 7.30†
Houston, Tex. S5	..7.30 7.70†
Jacks'ville, Fla. M8	7.425 7.95
Johnstown B2(48).	6.90 7.45*
Joliet, Ill. A7	....6.90 7.30†
Kansas City, Mo. S5	7.50 7.90†
Kokomo C16	....7.00 7.40†
Los Angeles B3	...7.85 ....
Minnequa C10	...7.15 7.55**
Monessen P7 (48).	6.90 7.45
Palmer W12	....7.20 7.60†
Pitts., Calif. C11	..7.85 8.25†
Portsmouth, O. P12	6.90 ....
Rankin A7	.....6.90 7.30†
So. Chi'go R2	....6.90 7.30**
S.S. Frn. C10	...7.85 8.25**
Spar'wsPt. B2(48).	7.00 7.55*
Str'g(1)(48) N15.	6.90 7.45
Struthers, O. (48) Y1	6.90 7.40‡
Worcester A7	....7.20 ....

* Based on 11c zinc; † 5c zinc; ‡ Less than 10c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga

	Col.
Ala. City, Ala. R2	.....146**
Ala. City, 17 ga. R2	..241**
Ala. City, 18 ga. R2	..251**
Aliq'ppa, Pa. 9-14½ga.	J5 149‖
Atlanta A11	151
Bartonville, Ill. K4	151
Crawfordsville, Ind.	M8..151
Donora, Pa. A7	.....146†
Duluth, Minn. A7	.....146†
Fairfield, Ala T2	.....146†
Houston, Tex. S5	.....154†
Johnstown, Pa. (43) B2	..149
Joliet, Ill. A7	.....146†
Kansas City, Mo. S5	....158†
Kokomo, Ind. C16	.....148†
Minnequa, Colo. C10	...154**
Monessen, Pa. 9 ga. P17.	.151
Pittsburg, Calif. C11	...169†
Rankin, Pa. A7	.....146†
So. Chicago, Ill. R2	....146**
Sterling, Ill. (1) N15	149

† Based on 5c zinc; * 11c zinc; ‖ 10c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
Alabama City, Ala. R2	...155
Atlanta A11	157
Bartonville, Ill. K4	157
Crawfordsville, Ind. M8	.157
Donora, Pa. A7	155
Duluth, Minn. A7	155
Fairfield, Ala. T2	155
Joliet, Ill. A7	155
Houston S5	163
Kansas City, Mo. S5	167
Kokomo, Ind. C16	157
Minnequa, Colo. C10	160
Pittsburg, Calif. C11	179
So. Chicago, Ill. R2	155
So. San Fran., Calif. C10	..179
Sparrows Point, Md. B2	..157
Sterling, Ill. (1) N15	155

WIRE, Barbed

	Col.
Alabama City, Ala. R2	159**
Aliquippa J5	.....156‖
Atlanta A11	164
Bartonville, Ill. K4	164
Crawfordsville, Ind. M8	..164
Donora, Pa. A7	.....159†
Duluth, Minn. A7	.....159†
Fairfield, Ala. T2	.....159†
Houston, Tex. S5	.....167†
Johnstown, Pa. B2	....162*
Joliet, Ill. A7	.....159†
Kansas City, Mo S5	.....171†
Kokomo, Ind. C16	.....161†
Minnequa, Colo. C10	..165**
Monessen, Pa. P7	163
Pittsburg, Calif. C11	...179†
Rankin, Pa. A7	.....159†
So. Chicago, Ill. R2	....159**
S. San Francisco C10	...179**
Sparrows Point, Md. B2	..164*
Sterling, Ill. (1) N15	162

† Based on 5c zinc; * 11c zinc; ‖ 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'ld. Stone	Galv. Stone
Ala. City R2	...13.15	14.70**
Aliquippa J5	..12.50	14.30‖
Bartonville K4	..13.25	15.10
Buffalo W12	....13.15	....
Cleveland A7	....13.15	....
Crawfordsville M8	13.25	15.10
Fostoria, O. S1	..13.25	14.80†
Johnstown B2	..13.15	15.00*
Kokomo C16	...12.60	14.15†
Minnequa C10	..13.40	15.10**
Palmer, Mas. W12	13.15	14.70*
Pitts., Calif. C11	.13.50	15.05†
So. Chicago R2	...13.15	14.70
Sparrows Pt. B2	13.25	15.10*
Sterling (1) N15	13.15	15.00
Waukegan A7	..13.15	14.70†
Worcester A7	...13.45	....

* Based on 11c zinc; † 5c zinc; ‖ 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
Alabama City, Ala. R2	...137
Aliquippa, Pa. J5	137
Atlanta A11	139
Bartonville, Ill. K4	139
Chicago, Ill. W13	137
Cleveland A9	142
Crawfordsville, Ind. M8	..139
Donora, Pa. A7	137
Duluth, Minn. A7	137
Fairfield, Ala. T2	137
Galveston, Tex. D7	139
Houston, Tex. S5	145
Johnstown, Pa. B2	137
Joliet, Ill. A7	137
Kansas City, Mo. S5	149
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	156
Rankin, Pa. A7	137
So. Chicago, Ill. R2	137
Sparrows Pt., Md. B2	139
Sterling, Ill. (1) N15	137
Worcester, Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken, Pa. A3	..$8.30
Wheeling, W.Va. W10	...8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Alamaba City, Ala. R2	...138
Aliquippa, Pa. J5	138
Atlanta A11	140
Bartonville, Ill. K4	140
Crawfordsville, Ind. M8	..140
Donora, Pa. A7	138
Duluth, Minn. A7	138
Fairfield, Ala T2	138
Johnstown, Pa. B2	138
Joliet, Ill. A7	138
Kokomo, Ind. C16	140
Minnequa, Colo. C10	143
Monessen, Pa. P7	138
Pittsburg, Calif. C11	157
Rankin, Pa. A7	138
So. Chicago, Ill. R2	138
Sparrows Pt. Md. B2	140
Sterling, Ill. (1) N15	138
Worcester, Mass. A7	144

FENCE POSTS

	Col.
Chicago Hts., Ill. C2, I-2.	.150
Duluth, Minn. A7	150
Franklin, Pa. F5	150
Johnstown, Pa. B2	145
Marion, O. P11	145
Minnequa, Colo. C10	155
Moline, Ill. R2	155
So. Chicago, Ill. R2	150
Tonawanda, N.Y. B12	150
Williamsport, Pa. S19	...150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ⅝-in.	5
¾-in. and larger	3
Longer than 6 in.:	
All diameters	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoes	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1¼", inclusive.	60
1⅜" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex regular & heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¾" to 1¼", inclusive.	40
⅞" to 1½", inclusive.	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5—10
Plated finishes	30—10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer, Pa. U5	4.45	4.35	4.40	5.35
Ensley, Ala. T2	4.45	4.35	....	5.35
Fairfield, Ala. T2	....	....	....	5.35
Gary, Ind. U5	4.45	4.35	4.40	....
Huntington, W.Va. W7	....	....	....	5.35
Indiana Harbor, Ind. I-2	4.45	4.35	4.40	....
Johnstown, Pa. B2	....	....	...(16)	5.35
Lackawanna, N.Y. B2	4.45	4.35	....	5.35
Minnequa, Colo. C10	4.45	4.35	....	5.85
Steelton, Pa. B2	4.45	4.35	....	5.35
Williamsport, Pa. S19	....	....	....	5.35

TIE PLATES

Fairfield, Ala. T2	.....5.275
Gary, Ind. U5	.....5.275
Ind. Harbor, Ind. I-2	...5.275
Lackawanna, N.Y. B2.	.5.275
Minnequa, Colo. C10	...5.275
Seattle B3	.....5.425
Steelton, Pa. B2	.....5.275
Torrance, Calif. C11	...5.425

TRACK BOLTS (20) Treated

Cleveland R2	.....11.50
Kansas City, Mo. S5	....11.50
Lebanon, Pa. B2	.....11.50
Minnequa, Colo. C10	...11.50
Pittsburgh O3	.....11.50
Pittsburgh P14	.....11.50
Seattle, Wash. B3	.....12.00

AXLES

Ind. Harbor, Ind. S13	....6.75
Johnstown, Pa. B2	.....6.75

JOINT BARS

Bessemer, Pa. U5	.....5.425
Fairfield, Ala. T2	.....5.425
Ind. Harbor, Ind. I-2	...5.425
Joliet, Ill. U5	.....5.425
Lackawanna, N.Y. B2	..5.425
Minnequa, Colo. C10	...5.425
Steelton, Pa. B2	.....5.425

SCREW SPIKES

Cleveland R2	.....11.00

STANDARD TRACK SPIKES

Fairfield, Ala. T2	.....7.30
Ind. Harbor, Ind. I-2, Y1	7.30
Kansas City, Mo. S5	.....7.30
Lebanon, Pa. B2	.....7.30
Minnequa, Colo. C10	....7.30
Pittsburgh J5	.....7.30
Seattle B3	.....7.80
So. Chicago, Ill. R2	....7.30
Struthers, O. Y1	.....7.30
Youngstown R2	.....7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	18.00
Unannealed	
Minus 100 mesh	14.50
Minus 35 mesh	10.25
Minus 20 mesh	10.00
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	11.25
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	.83.00-143.00
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	32.00
Ton lots	34.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	.28.75-37.50†
Bronze, ¼-ton lots	.31.00-39.00†
Copper:	
Electrolytic	.13.50*
Reduced	.13.50*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	.45.75‡
Nickel-Silver, ¼-ton lots	.48.50**
Phosphor-Bronze, ¼-ton lots	.58.50
Silicon	43.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	.14.50*
Zinc, ¼-ton lots	.18.25-32.00‡

Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S.-L.A.
(31) Base; deld. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	13.5	list	17.5	0.25	20	2.75	21.5	4.25	21.5	4.25	20.75	3.5	23.25	6
Ambridge, Pa. N2 (†)	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3 (*)	13.5	2.25	17.5	3.25	20	5.75	21.5	7.25	21.5	7.25	20.75	6.5	23.25	9
Youngstown Y1 (††)	13.5	+1.5	17.5	0.75	20	3.25	21.5	4.75	21.5	4.75	20.75	4	23.25	6.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	13.5	1.5	17.5	0.75	20	3.25	21.5	4.75	21.5	4.75	20.75	4	23.25	6.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		8c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	....	....	....	23.75	7.5	26.75	11.5	29.25	15	31.75	16
Alton, Ill. L1 (§)	...	...	....	....	....	....	21.75	6.5	24.75	10.5	27.25	14	29.75	14.75
Benwood, W. Va. W10(††)	24	+2.5	15.25	+8.25	7.25	+14.25	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75
Butler, Pa. F6‡‡	25	+1.5	17	+6.5	9.5	+12	....	..	....	...	....	..	....	....
Etna, Pa. N2 (†)	...	...	....	....	....	....	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75
Fairless, Pa. N3	...	...	....	....	....	....	19.25	..	22.25	...	24.75	..	27.25	....
Fontana, Calif. K1 (§)	...	...	....	....	....	....	10.75	+4.5	13.75	+0.5	16.25	3	18.75	3.75
Ind. Harbor Y1 (††)	...	...	....	....	....	....	22.75	7.5	25.75	11.5	28.25	15	30.75	15.75
Lorain, O. N3 (*)	...	...	....	....	....	....	23.75	13.5	26.75	17.5	29.25	21	31.75	20.5
Sharon, Pa. S4 (‡)	25	+1.5	17	+6.5	9.5	+12	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75
Sparrows Pt., Md. B2 (§)	23	+3.5	15	+8.5	7.5	+14	31.75	6.5	24.75	10.5	27.25	13	29.75	14
Youngstown R2 (**)	...	...	....	....	....	....	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75
Youngstown Y1 (††)	...	...	....	....	....	....	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75
Wheatland, Pa. W9 (§)	23	+3.5	15	+8.5	7.5	+14	23.75	8.5	26.75	12.5	29.25	16	31.75	16.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.25	17	32.75	17.5	34.25	17.5	34.25	17.5	....	...	....	...
Alton, Ill. L1 (§)	30.25	15.75	30.75	16.25	32.25	16	32.25	16	23.25	6.75	23.25	6.75
Benwood, W. Va. W10(††)	32.25	17.75	32.75	18.25	34.25	18	34.25	18	25.5	8.75	25.5	8.75
Etna, Pa. N2 (†)	32.25	17.75	32.75	18.25	34.25	19	34.25	19	25.5	8.75	25.5	8.75
Fairless, Pa. N3	27.75	....	28.25	....	29.75	...	29.75	...	21	...	21	...
Fontana, Calif. K1 (§)	19.25	4.75	19.75	5.25	21.25	5	21.25	5	12.5	+4.25	12.5	+4.25
Ind. Harbor, Ind. Y1 (††)	31.25	16.75	31.75	17.25	33.25	17	33.25	17	....	...	....	...
Lorain, O. N3 (*)	32.25	21.5	32.75	22	34.25	20.5	34.25	20.5	....	...	....	...
Sharon, Pa. M6	32.25	17.75	32.75	18.25	34.25	18	34.25	18	....	...	....	...
Sparrows Pt., Md. B2 (§)	30.25	16	29.75	15.5	32.25	15.5	32.25	15.5	23.5	6.25	23.5	6.25
Youngstown R2 (**)	32.25	17.75	32.75	18.25	34.25	18	34.25	18	25.5	8.75	25.5	8.75
Youngstown Y1 (††)	32.25	17.75	32.75	18.25	34.25	18	34.25	18	....	...	....	...
Wheatland, Pa. W9 (‡)	32.25	17.75	32.75	18.25	34.25	18	34.25	18	....	...	....	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), over 9c to 11c inclusive; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment; (‡‡), 11c.

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	49.00	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	53.25	55.60	59.00	62.75	62.75
316L	....	....	52.50	....	58.25	61.00	64.25	67.75	67.75
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	46.00	50.50	50.50
330	....	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
403	....	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	50.25	39.50	40.75	50.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co, Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co., Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co., Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Cladding	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
Stainless				
302	....	31.00	31.00	77.00
304	27.60-28.10	32.50-32.70	32.50	77.00
310	36.50	41.00	....	144.00
316	32.60-33.10	37.70-42.75	42.75	....
318	37.00-37.50	42.20-42.70	....	....
321	29.36-29.80	34.40-37.00	37.00	111.00
347	30.40-30.90	35.50-40.50	40.50	130.00
405	23.40-23.90	30.60-31.10	....	....
410	22.90-23.40	30.10-30.60	....	....
430	23.40	30.60	....	....
Inconel	46.90	61.90	....	165.00
Nickel	38.30	51.70	....	....
Monel	39.70	52.66	....	....
Copper*	....	....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

* Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; Copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
19	4	2	12	...	3.990
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
18	4	1	5	...	2.250
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.090

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	52.38	52.88	....	....
Birmingham U5	....	52.88	56.50†	....
Gadsden, Ala. R2	52.38	52.88	....	....
Woodward, Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	57.50
Boston, del.	66.65	67.15	67.65	....
Rochester, N.Y., del.	59.02	59.52	60.02	....
Syracuse, N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary, Ind. U5	56.00	....	56.50	....
IndianaHarbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Chester, Pa. C31	48.00	48.50	49.00	....
Philadelphia, del.	49.66	50.16	50.66	....
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Troy, N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	58.66
Verona, Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
GraniteCity, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	58.00	59.00	59.00	....
Rockwood, Tenn. T2	....	52.50*	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls, N.Y. P15	$80.50
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00
Wenatchee, Wash. OH & Fdry, freight allowed K2	85.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, del.	67.55
Troy, N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham, St. Paul, 15 cents; Boston, Philadelphia, New York, 10 cents; Seattle and Spokane, Wash., no charge; at Buffalo and Philadelphia, on cold-finished bars and sheets, alloy bars and galvanized sheets, 25 cents.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡§	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††‖		Carbon	Floor
Baltimore	6.22	7.51	7.77	....	6.89	...	6.88	8.52[6]	12.04	6.92	6.57	7.96**
Birmingham	6.35	7.35	8.25[2]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[9]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.77	6.70	7.80
Carnegie, Pa.	6.38	...	8.30	....	6.72	...	6.51	7.85	12.15	6.72	6.65	6.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.25	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.35	7.35	8.75
Los Angeles	7.40	9.25	9.80	50.15	7.75	11.75	7.35	10.05	13.20	7.55	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	6.81	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[6]	10.53	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.29	8.08	41.98[9]	6.96	8.80	6.74	8.19[4]	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64**
Portland, Oreg.	7.60	8.75	9.70	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.03	8.03	8.96	....	7.28	...	7.16	8.26	....	7.12	7.19	8.30
San Francisco	7.55	8.95	9.35	48.15	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	8.30	...	7.80	10.85[8]	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston where base is 10,000 lb. [2]—500 to 9999 lb; [4]—4000 lb and over; [6]—1000 to 1999 lbs; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

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It Takes Longer To Get Sheet, Strip

Chicago producer lengthens delivery times on three groups of light, flat-rolled products. Other areas, too, expect longer delivery cycles

Sheet Prices, Pages 134 & 135

DEMAND for light, flat-rolled products is a little stronger.

You can sense that from the lengthening of delivery times on three product groups by Inland Steel Co., Chicago. Its Aug. 30 list of steel availability indicates delivery on cold-rolled sheets and strip, electrical sheets and coils and enameling iron sheets will take five to six weeks. Delivery on cold-rolled sheets and strip had been four weeks and on electrical sheets and coils and enameling iron sheets, four to five weeks. Until now, delivery times have tended to shrink.

Elsewhere, Also—Philadelphia, too, reports longer cycles, with six weeks expected soon for cold-rolled sheets; four to six weeks for hot-rolled; specialty sheets up to six weeks; seven to eight weeks for conventional hot-dipped galvanized sheets and 11 to 12 weeks for continuous hot-dipped sheets. Duct makers and air conditioning account for much of the trend.

Elsewhere, the automotive industry sets the mood for September and October, with little business expected from that area in the former and a healthy pickup in the latter. Thirty days should determine the extent of that business for fourth quarter.

Stainless Improves — Boston reports a possible weakening in galvanized volume for October, but that will be offset by better bookings of cold-rolled, silicon, enameling and stainless sheets. New York also reports better inquiries for stainless and aircraft grades. Fabricators there are fairly busy, with a 40-hour week the rule.

West Coast business was no better in August than in preceding months, but office equipment makers and appliance manufacturers are upping their orders. First-half sales volume was only slightly higher than that for the like period last year.

Boost for Galvanized—The grain bin storage program continues to hold up, as evidenced by a contract to Kilby Steel Co., Anniston, Ala., for 1375 of the structures. Galvanized sheets and angles are involved.

India Supply mission is asking bids, closing Oct. 21, on 15,730 tons of plain black sheets and 5000 tons of galvanized sheets.

Steel Bars . . .

Bar Prices, Page 134

Philadelphia — Cold drawers are helping support the bar market here as their August business topped July, which in turn was better than June. While fast delivery, depending on size, continues the rule in bars, producers have noted their order volume is picking up but tonnage isn't. Hot-rolled bars are moving better because forge shops and jobbers are doing more. Cold drawers have sizable stocks of hot bars and are not ordering from mills.

Boston—Cold finishers and forge shops are stressing prompt shipment in placing slightly heavier orders for bars. Out of the market for months, at least two textile mill equipment shops have placed moderate orders. This indicates low stocks because new business booked by this group has not improved materially.

New York — Lackadaisical buying interest continues in bars. Easy delivery is the rule, time depending on mill schedules and section desired.

St. Louis—Merchant bar producers are heartened by the continued firm demand. Orders are rarely booked more than two or three months in advance, but the requests for immediate shipment accompanying most orders indicate bar inventories in the hands of fabricators are generally low.

Pittsburgh—With vacations ended at consuming plants, sales are improving gradually. Increase is still too scattered to be significant. Main consumers, as well as warehouses, report no appreciable gain in requirements for September.

Chicago—Hot-rolled and cold-finished bars are in somewhat better demand. Since neither automotive nor farm implement requirements figure in this in any important way, barmakers are encouraged as to future prospects.

Los Angeles — Increased orders from aircraft subcontractors for cold-finished alloy bars has raised prospects of an active fall.

Plates . . .

Plate Prices, Page 134

New York—A little reawakening in plate sales is felt here, but it's not of great strength. "There are some freight car inquiries at the present time and a relatively larger number of passenger car inquiries," John E. Rovensky, retiring chairman of ACF Industries Inc., says. "We could have an excellent second six months if freight car orders in particular could be obtained rather promptly."

Pittsburgh—The practice of ordering for immediate delivery has spread to plate products, following a downtrend in sales. High rates of construction keep sales at a fair rate, but requirements of boat and railroad builders are low.

Boston—Shipyards are stirring up some fourth-quarter volume, including high-tensile plates for the Bath, Me., yard. The Navy accounts for

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.95	$4.95	$4.85	$5.23
Bar Size Angles	4.65	4.65	4.55	4.93
Structural Angles	4.65	4.65	4.55	4.93
I-Beams	4.50	4.50	4.40	4.73
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft. ¾ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire	6.00	6.00	6.00	6.23
Merchant Bars	5.00	5.00	5.00	5.33
Hot-Rolled Bands	5.15	5.15	5.10	5.43
Wire Rods, Thomas Commercial No. 5	4.80	4.87	4.85	5.13
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Sizes OD				
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

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most of the business and will place orders soon for 3875 tons of high-tensile and special heat-treated stock. Light carbon grades for tank work are on a prompt-shipment basis with inventory buying slack. Plate shops are slow to buy beyond immediate needs.

Philadelphia — Platemakers recorded their second consecutive week of order gains though the improvement is far from spectacular. Miscellaneous orders from regular customers are in greater volume, but not big tonnages. Inventories are now more in line with what fabricators want. Gradual increase over the balance of the year is expected. Navy work is doing fairly well with repairs scheduled and inquiries for the *Saratoga* going out for high-tensile and medium welding steel used in the hull.

Chicago — Plate fabricators are working down inventories faster than they are booking new business. However, inquiries are being received in fair volume and there is encouragement for a fourth quarter upturn.

Wire . . .

Wire Prices, Pages 136 & 137

Boston—In exceptional cases wire consumers have resumed buying after being out of the market for months, but only in few instances do orders cover estimated requirements well into fourth quarter.

New York—While some automotive orders are trickling in for October, wire volume for new model is not expected before late this month when some tonnage for November delivery also will be specified. Bookings for September thus far do not indicate mill schedules will be much heavier than August.

Tubular Goods . . .

Tubular Goods Prices, Page 138

Pittsburgh—Early fourth-quarter requirements for welded tube are increasing. Some seamless specialty products are declining; sales of seamless tube between 6 and 8 in. are very good while smaller sizes move more slowly.

Boston—Building construction accounts for a substantial part of jobbers' volume of tubular goods business. With mill deliveries on butt weld being made within ten days from stock, distributors are merely keeping inventories in balance by replacement purchases.

St. Louis—Pressure on pipe in the residential and commercial construction sizes continues strong. Distributors report unusually fast turnover of pipe stock.

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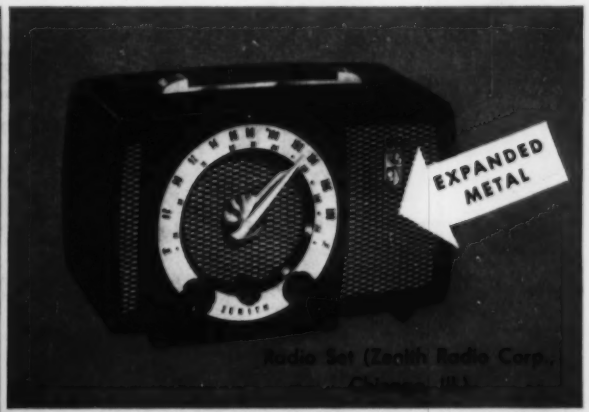

Radio Set (Zenith Radio Corp., Chicago, Ill.)

Grill for Outdoor Fireplace (Hancock Iron Works, Pontiac, Mich.)

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PM-49

Current Ferroally Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C7% approx.). Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained managanese over 76% or under 74%, respectively.
(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb or alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carboritam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract. c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20 % each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, Pa., $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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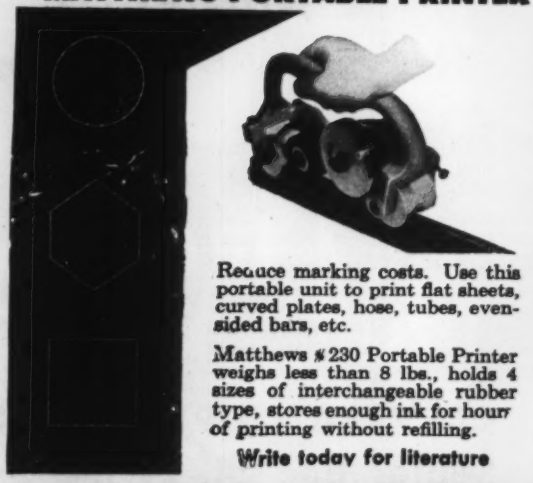

Reduce marking costs. Use this portable unit to print flat sheets, curved plates, hose, tubes, even-sided bars, etc.

Matthews #230 Portable Printer weighs less than 8 lbs., holds 4 sizes of interchangeable rubber type, stores enough ink for hours of printing without refilling.

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For more than 66 years we have been producing metal-working tools and adding to our standard line. Today we keep such an extensive range of styles and sizes of PUNCHES and DIES on hand that we can fit most makes of punch presses from stock. The tools you need are *immediately available* when you need them—at regular *low, standard prices.*

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Tin Plate . . .

Tin Plate Prices, Page 136

Tin plate prices are going up on Oct. 1.

U. S. Steel Corp. said the increase (the first since 1952) will be in effect for contracts made in the six months ending next Mar. 31. Tin plate prices are announced every six months.

The hike in mill price base is 10 cents a base box for all products except holloware enameling black plate, which advanced a tenth of a cent a pound.

U. S. Steel's new prices per base box on electrolytic tin plate, 0.25 lb coating, will be $7.50 at Irvin, Pa., and Gary, Ind., and $7.60 at Fairless, Pa. New prices on 0.50 lb coating will be $7.75 at Irvin and Gary and $7.85 at Fairless. New prices on 0.75 lb coating will be $8.15 at Irvin and Gary and $8.25 at Fairless.

Hot-dipped tin plate, 1.25 lb coating, will be $8.80 at Irvin and Gary and $8.90 at Fairless. New prices for 1.50 lb coating will be $9.05 at Irvin and Gary and $9.15 at Fairless.

Black plate prices per base box will be $6.60 at Irvin and Gary and $6.70 at Fairless.

Special coated manufacturing ternes will be $7.85 per base box at Irvin and Gary.

Holloware enameling black plate, 29 gage, will be 6.20 cents a pound at Irvin and Gary.

Pittsburgh — Seasonal decline in fourth-quarter tin plate requirements is not expected to be severe this year. With a growing variety of products canned, long-term trend is toward less seasonality in sales.

Warehouse . . .

Warehouse Prices, Page 139

Boston—Mild improvement in steel buying from warehouses is marked by small individual orders with a few for larger quantities. Construction grades are more active than industrial. Some wavering of prices is noted at the secondary level, especially for slow moving sizes and grades. Some of this tonnage has been stagnant for months, even at price concessions.

New York—Slight increase in number of small orders points to mild improvement in warehouse volume. Volume is well distributed as to products, but fact that average order is small individually tends to add to distribution costs.

Philadelphia—Upward trend for the rest of the year is foreseen by district warehouses. Flat-rolled prod-

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-$25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 93c-95c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	nom. 34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.80-$4.20
60-65%	4.65-4.75

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill. Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, Niles, O., Hays, Pa., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala. $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Peria, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa. $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $189.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburner bulk; Luning, Nev., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.13
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.06
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.42
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net ton, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.85

ucts are coming back stronger and going to such a variety of users as makers of kitchen cabinets, small appliances, lighting equipment. Wide flange beams are still in tight supply.

Pittsburgh — A gradual gain in small fabricators' requirements offsets the lack of large volume orders. As summer vacations end, a growing number of small plants require rapid shipments.

Chicago—Warehouse steel sales here in August were somewhat better than July, but the margin wasn't great. Some improvement in September is anticipated.

Birmingham—Some improvement in shipments from local warehouses is noted. Smaller users of steel likely will be increasingly in the market through the remainder of the year.

Los Angeles—With construction projects booming in this district, distributors report an increased demand for pipe. Other products are in lighter demand.

San Francisco—August turned out to be a slightly better sales month than July. The belief is that September likely will be among the better months of the year. Distributors still keep inventories at minimum levels.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 134

Boston — Demand for reinforcing bars is heavy although shop distributors are shading prices to meet competition. Contractors generally have not lowered estimates on concrete bars in place, but construction and bridge engineering estimates are lower.

Pig Iron . . .

Pig Iron Prices, Page 139

Chicago—August pig iron sales approximated June business and books for September indicate some further improvement can be expected. With foundries running slack and holding inventories to the minimum, there is much spot ordering of iron as need for it develops. Automotive requirements for castings provide hope for the next 60 days. Farm machinery prospects are disappointing.

Philadelphia—Pig iron orders received from district foundries were larger during the latter part of August from district foundries. Prices of imported iron have firmed at higher levels. The Chester, Pa., producer continues quotations on basic, malleable and No. 2 foundry iron at $10 under other district producers.

Boston—While no rush for iron is expected, shipments this month are expected to be heavier. Many small foundries went down to rock bottom on inventories and will require more iron to maintain even the recent low melt. Several jobbing shops report an increase in orders for castings. Machine tool requirements are off from the peak, but castings are still needed. Bullard Co., Bridgeport, Conn., recently took off its third shift.

New York — Suppliers of pig iron expect two market factors to alleviate the long drought in their business. Users of castings have depleted reserves and at the same time foundries' replacement orders for iron have not kept pace with consumption.

Birmingham—Pig iron demand has strengthened somewhat since close of the vacation season in foundries. Merchant melters do not anticipate marked improvement this year.

Structural Shapes . . .

Structural Shape Prices, Page 134

Boston — With shop backlogs around three months and more tonnage estimated, competition for structural steel in place brings prices under pressure. Split contracts crop

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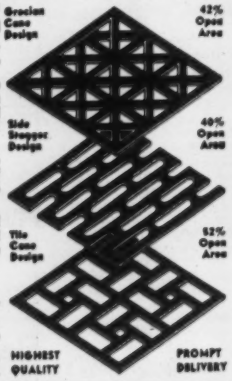

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By Albert Portevin

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69 illustrations — Price $5.00 Postpaid

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out, one shop taking girder work and another beam spans for the same project; a third may take bridge shoes and other miscellaneous work. This applies mainly to smaller bridge projects. At least three district shops are fabricating more bridge work than ever before. Plain material supply is ample although little tonnage is coming from Pittsburgh because the largest producer in that district is not equalizing. Pricewise, delivered price from Pheonixville, Pa., is lowest at Boston, around $6.80 per ton under Bethlehem, Pa.

New York — Total tonnage of structural steel fabricated is about 10 per cent above last year, but dollar intake by individual fabricators is lower because there are more fabricators bidding for work and shaving bids to get it.

Philadelphia—Prices of fabricated structural material is firming a bit. Most fabricators have a 2½ to 3½-month backlog now, but in recent months they were figuring bids closely to maintain their backlogs.

Pittsburgh—Continued high level of construction maintains normal production at structural mills. A sizable fraction of work in this area is in highway and bridge construction, causing brisk third-quarter shipments of wide flange beams.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7970 tons, bank and office building, Second National Bank, Houston, Tex., to Consolidated-Western Division, United States Steel Corp., Los Angeles; W. S. Bellows Construction Co., Houston, general contractor.

1540 tons, double cantilever maintenance hangar, Sewart Air Field base, Tennessee, to Decatur Iron & Steel Co., Decatur, Ala.; Sun Construction Co., Knoxville, Tenn., general contractor.

1050 tons, bridge work, section 35B, northeast extension, Pennsylvania turnpike, Montgomery county, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, shops and hangar, Otis Air Field base, Falmouth, Mass., to Capitol Steel & Iron Co., Oklahoma City, Okla.; Theodore Loranger & Sons Co., New Bedford, Mass., general contractor; Bethlehem Steel Co., Bethlehem, Pa., reinforcing bars.

330 tons, junior-senior high school building, Clark Summit, Pa., from Tabone & Barbera, Pittston, Pa., to Pine Brook Iron Co., Scranton, Pa.

140 tons, geriatric building, state hospital, Augusta, Me., to Progressive Iron Works, Inc., Portland, Me.; Stewart & Williams Inc., Augusta, general contractor; reinforcing to Bancroft & Martin Rolling Mills Co., South Portland, Me.

STRUCTURAL STEEL PENDING

13,000 tons, bridge superstructure, Philadelphia approach, contract P-3, Delaware River Port Authority; bids Sept. 9.

5300 tons, 31-span highway viaduct and ramp, Northeastern expressway, Chelsea, Mass., Commonwealth of Massachusetts; bids Sept. 14.

5200 tons, state highway bridge, Northeast Expressway, Chelsea, Mass.; bids postponed to Sept. 14 from Aug. 31, Boston.

1921 tons, 3-span bridge, Horace Harding expressway over Queens boulevard, Triboro Bridge & Tunnel Authority, Queens, N. Y.

1420 tons, 220-ft double leaf bascule bridge, Walnut street over Christina river, Delaware, Delaware State Highway Dept.; bids Sept. 1.

1400 tons, bridgework, northeast extension, Pennsylvania Turnpike, Montgomery county and Towamcin, Lower Salford and Franconia townships.

1400 tons, highway bridge, section 35D, northeast section, Pennsylvania turnpike, Pennsylvania Turnpike Commission; bids Sept. 7.

1200 tons, apartment building, 56th street and Lexington avenue, New York; H. Weisner & Sons, New York, contractors; bids asked.

920 tons, bridge work, section 36B, Pennsylvania turnpike, northeast extension, Lehigh county, Pennsylvania Turnpike Commission; bids Sept. 23.

800 tons, school, Penns Valley Area Joint School Authority, Spring Mills, Pa.; bids Sept. 2.

800 tons, Boston central artery viaduct, High street to Olive street, Commonwealth of Massachusetts; bids Sept. 14.

760 tons, I-beam highway bridge, New Castle county, Delaware state highway department; bids Sept. 8.

633 tons, I-beam spans, Chester township, Delaware county, Pennsylvania; Pennsylvania state department of highways.

500 tons, apartment building, 56th street and Lexington Avenue, New York; H. Weisner & Sons, New York, contractors; bids asked.

500 tons, high school building, West Springfield, Mass.; bids Sept. 16.

385 tons, state highway bridges, Athol-Phillipston, Mass.; bids Sept. 8, Boston.

378 tons, bridge work, section 36C, northeast extension, Pennsylvania turnpike, Pennsylvania Turnpike Commission; bids Sept. 23.

200 tons, high school, Oneida county, New York; F. D. Rich, general contractor; bids asked.

130 tons, reconstruction, east end of Brigantine bridge, Absecon channel, Atlantic City, N. J.; bids Sept. 14, Trenton, N. J.

130 tons, reconstruction, Brigantine bridge, Atlanta county, New Jersey state highway department; bids Sept. 14.

120 tons, pumping plant, Campbell Soup Co., Napoleon, O.; bids Sept. 13.

REINFORCING BARS . . .

REINFORCING BARS PLACED

840 tons, hospital building, Memorial hospital, Richmond, Va., to Virginia Steel Co., Richmond; John Tester & Son Inc., Washington, general contractor; Liphart Structural Steel Co., Richmond, 75 tons, structural steel.

770 tons, bank and office building, Second National Bank, Houston, Tex., to Alamo Iron Works, San Antonio, Tex.; W. S. Bellows Construction Co., Houston, general contractor.

450 tons, hospital, MacDill field, Tampa, Fla., to Connors Steel Co., Birmingham; Ray M. Lee Co., Atlanta, general contractor; structural steel to Aetna Steel Fabricators, Tampa.

240 tons, double cantilever maintenance hangar, Sewart Air Field base, Tennessee, to Connors Steel Co., Birmingham.

PLATES . . .

PLATES PENDING

3875 tons, high tensile and special heat treated, Navy; bids in to central purchasing office, Washington.

100 tons, floor plates, Navy, east and west yards; bids Sept. 13, central purchasing office, Washington.

PIPE . . .

STEEL PIPE PLACED

150 tons, aircraft fueling system, Otis Air Field base, Falmouth, Mass., to National Tube Co., New York; J. N. McGlame Co., Brookline, Mass., general contractor.

RAILS, CARS . . .

RAILROAD CARS PLACED

Union Pacific, 300 automobile and 200 box (50 ton capacity) to Pullman-Standard Mfg. Co. and 200 tank cars, 19,000-gallon capacity, to American Car & Foundry Co., Milton, Pa.

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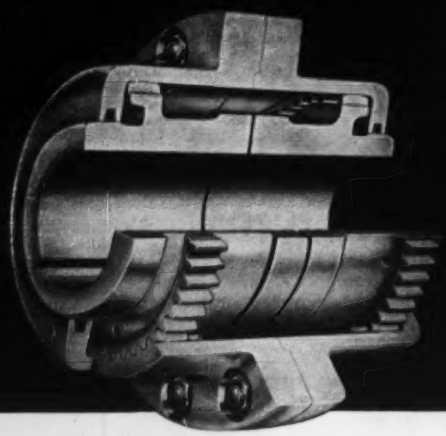

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Perhaps by cooperating with your engineers in details of design and pattern construction we may be able to save you both machining and assembling costs.

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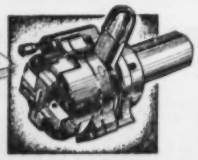

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NEA

Eyes are on Chicago Mercantile Exchange where . . .

Trading Is Opened to Scrap Futures

TRADING in iron and steel scrap futures contracts will be inaugurated on the Chicago Mercantile Exchange, 110 N. Franklin St., on Sept. 7. Contracts initially will be for delivery in January and March, 1955, although those for delivery in other months may be opened at discretion of the board of governors. Trading will be in No. 1 heavy melting steel, with No. 2 heavy melting deliverable as a substitution at a $5-a-ton discount.

Interest in the outcome of the venture is high, especially since major consumers, scrap brokers and dealers gave it the thumbs down treatment.

Until now, commodities traded on the exchange have been eggs, onions, butter, potatoes, apples, frozen eggs and dressed poultry.

Opposition—Dissenters claim the activity can be of no value to producers or consumers of scrap. There is belief it will impede the free and orderly flow of scrap from producer to consumer. "Speculative and not in the public interest," is the way some view it.

Principals indicate no change in their views as the opening of trading arrives. The exchange asserts that successful trading can ensue without active participation of consumers. But some consumers display interest in the trading. It reports also that five scrap brokers purchased memberships in the exchange and that one is bidding for a membership. Of these, four are said to be from the Chicago area and two from outside the district. Memberships are available only through transfer from existing members. Current price is about $4000.

Watching—Observers wonder how scrap inspection will work in futures trading. Exchange rules say that an official inspection shall be final. Robert W. Hunt Co., Chicago, is the official inspector.

In opposition, the Chicago Chapter, Institute of Scrap Iron & Steel, contended: Where it is impossible to set a uniform future specification acceptable to steel mills or consumers

(*Please turn to page* 154)

The world's best . . . one-piece, drop forged—not welded—of mild carbon steel, heat-treated, with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36; ¾—$1.58; ⅞—$1.89. Write for price list.

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MILFORD 3, NEW HAMPSHIRE

For stress, wear or vibration a

GRIPCO LOCK NUT

will hold tighter, wear longer, cost less!

The Gripco Lock Nut, with its simple, one-piece design, has given industry a tighter, more positive holding action for quicker fastener application at less initial cost. It provides frictional resistance to vibration and loosening torque — is faster to use — permits repeated removal and reapplication—simplifies production—lowers manufacturing and maintenance costs — has improved the durability of hundreds of products—and has insured greater customer satisfaction. If stress, wear or vibration is your problem, specify Gripco Lock Nuts for greater holding power. Impervious to oil or water. Write for samples and full details.

GRIPCO PRODUCTS INCLUDE:
Gripco Lock Nuts, New Gripco "Clinch" Nuts, Gripco Hi-Nuts, Gripco Pilot-Projection and Countersunk Weld Nuts with or without Gripco locking feature.

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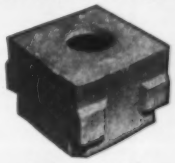
INGOT MOLD PLUGS



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COMPANY.....
ADDRESS.....
CITY..... ZONE.. STATE....

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Sept. 1	$29.00
Sept. 25	29.00
Aug. Avg.	28.80
Sept., 1953	36.93
Sept., 1949	26.07

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	29.00-30.00
No. 2 heavy melting...	26.00-27.00
No. 1 bundles	29.00-30.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings..	19.00-20.00
Cast iron borings	18.00-19.00
Cut structurals, 5 ft l'gths	31.00-32.00
Heavy turnings	26.00-27.00
Punchings & plate scrap	32.00-33.00
Electric furnace bundles	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	*36.00-37.00*
Charging box cast	32.00-33.00
Heavy breakable cast..	30.00-31.00
Unstripped motor blocks	23.00-24.00
No. 1 machinery cast..	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 2-ft and under..	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths..	37.00-38.00
Railroad specialties ...	34.00-35.00

Stainless Steel Scrap

18-8 bundles & solids	*180.00-195.00*
18-8 turnings	85.00-90.00
430 bundles & solids ..	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting...	28.00-29.00
No. 2 heavy melting...	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Machine shop turnings.	12.00-13.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings..	16.00-17.00
Cast iron borings	16.00-17.00
Low phos.	*30.00-31.00*
Cut structural plate 2 ft and under	*34.00-35.00*
Alloy free, short shovel turnings	*17.50-18.50*
Electric furnace bundles	29.00-30.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	26.50-27.50
Stove plate	33.00-34.00
Heavy breakable cast..	25.50-26.50
Unstripped motor blocks	25.00-26.00
Brake shoes	2[illegible].00-30.00
Clean auto cast	43.00-44.00
No. 1 wheels	35.00-36.00
Burnt cast	27.00-28.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
R.R. malleable	41.00-42.00
Rails, 3-ft and under..	43.00-44.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths.	40.00-41.00
Cast steel	34.00-35.00
Railroad specialties	*35.00-36.00*
Uncut tires	36.00-37.00
Angles, splice bars	41.00-42.00
Rails, Rerolling	45.00-46.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids....	nom. 160.00-170.00
18-8 turnings .....nom.	70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*23.00-24.00*
Machine shop turnings.	13.00-14.00
Short shovel turnings..	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	*33.00-34.00*
Electric furnace bundles	31.00-32.00

Railroad Scrap

No. 1 R.R. heavy melt.	*32.00-33.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	27.00-28.00
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	27.00-28.00
No. 2 bundles	21.00-22.00
No. 1 busheling	27.00-28.00
Electric furnace bundles	28.50
Machine shop turnings.	16.00
Mixed borings, turnings	16.00
Short shovel turnings..	19.00
Structurals & plate ...	29.00-30.00
Heavy turnings	24.00-25.00
Couplers, springs, wheels	32.00-33.00
Rail crops, 2 ft & under	42.00-43.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Malleable	37.00*
Heavy breakable cast..	36.00-36.50
Unstripped motor blocks	nom.
Drop broken machinery	41.00-42.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting ..	21.00-21.50
No. 2 heavy melting ...	18.00-19.00
No. 1 bundles	21.00-21.50
No. 2 bundles	15.50-16.50
Machine shop turnings .	7.00-8.00
Mixed borings, short turnings	10.00-11.00
Low phos. (structural & plate)	24.00-25.00
Short shovel turnings..	10.50-11.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unsrripped motor blocks	19.00-20.00*

Stainless Steel

18-8 sheets, clips, solids 170.00-175.00	
18-8 borings, turnings..	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	18.50-19-00*
No. 2 heavy melting...	15.00-15.50
No. 1 bundles	18.00-19.00
No. 2 bundles	14.00-15.00
Mixed borings, turnings	8.50-9.50
Machine shop turnings.	4.00-5.00
Short shovel turnings..	10.00-11.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast..	32.00-33.00

* $4 to $4.50 higher for export.

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	25.50-26.50
No. 2 heavy melting...	22.50-23.50
No. 1 bundles	25.50-26.50
No. 2 bundles	19.00-20.00
No. 1 busheling	25.50-26.50
Machine shop turnings.	11.00-12.00
Mixed borings, turnings	14.50-15.50
Short shovel turnings..	14.50-15.50
Cast iron borings	14.50-15.50
Low phos. 18-in.	32.00-33.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast..	35.00
Charging box cast	36.00
Drop broken machinery	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00
Rails, 18-in. and under	43.00-44.00
Rails, random lengths..	36.00-37.00

CHICAGO

No. 1 heavy melting..	29.00-31.00
No. 2 heavy melting..	27.00-28.00
No. 1 factory bundles.	31.00-32.00
No. 1 dealer bundles..	28.00-29.00
No. 2 bundles	22.00-23.00
No. 1 busheling	29.00-31.00
Machine shop turnings.	14.00-15.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings..	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals, 3-ft ..	32.00-33.00
Punching & plate scrap	32.00-33.00
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Stove plate	*29.00-30.00*
Unstripped motor blocks	24.00-25.00
Clean auto cast	*39.00-40.00*
Drop broken machinery	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
R.R. malleable	40.00-42.00
Rails, 2-ft. and under	*44.00-45.00*
Rails, 18-in. and under	*45.00-46.00*
Angles, splice bars	37.00-38.00
Rails, rerolling	44.00-45.00

Stainless Steel Scrap

18-8 clips & solids ...	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00
430 turnings	20.00-25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	22.50
No. 2 heavy melting...	18.50
No. 1 bundles	23.50
No. 2 bundles	16.50
No. 1 busheling	21.50
Machine shop turnings.	7.00
Mixed borings, turnings	7.00
Short shovel turnings..	9.00
Punchings & plate scrap	24.00

Cast Iron Grades

No. 1 cupola	33.00
Charging box cast	27.00
Stove plate	29.00
Heavy breakable	23.00
Unstripped motor blocks	18.00
Clean auto cast	37.00
Malleable	28.00

BUFFALO

No. 1 heavy melting...	26.00-27.00
No. 2 heavy melting...	22.00-23.00
No. 1 bundles	26.00-27.00
No. 2 bundles	20.00-21.00
No. 1 busheling	26.00-27.00
Machine shop turnings.	13.00-14.00
Mixed borings,turnings	16.50-17.00
Short shovel turnings..	17.50-18.00
Cast iron borings.....	16.50-17.00
Low phos.	28.00-28.50

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-36.00
No. 1 machinery	39.00-40.00

Railroad Scrap

Rails, random lengths.	33.00-34.00
Rails, 3-ft and under..	40.00-41.00
Railroad specialties ...	34.50-35.50

BIRMINGHAM

No. 1 heavy melting...	19.50-20.50
No. 2 heavy melting...	18.50-19.50
No. 1 bundles	18.00-19.00
No. 2 bundles	16.00-17.00
Cast iron borings	15.00-16.00
Short shovel turnings..	16.00-17.00
Machine shop turnings.	15.00-16.00
Electric furnace bundles	26.00-27.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	43.50-44.50
Stove plate	40.50-41.50
Bar crops and plate	*30.50-31.50*
Structural plate 2 ft.	*30.50-31.50*
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	26.00-27.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	39.00-40.00
Angles, splice bars	36.00-37.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	25.50
No. 2 heavy melting...	23.50
No. 1 bundles	25.50
No. 2 bundles	19.25
Machine shop turnings.	14.00
Short shovel turnings..	16.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	29.00
Heavy breakable cast..	29.00
Unstripped motor blocks	29.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	31.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.25
Rails, 18-in. and under	41.00
Rails, random lengths	*39.00*
Rails, rerolling	*47.00*
Uncut tires	32.50
Angles, splice bars	*35.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting....	25.00
No. 2 heavy melting...	21.00
No. 1 bundles	21.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings.	11.50
Mixed borings, turnings	11.50
Short shovel turnings..	11.50
Electric furnace, No. 1	32.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	34.00-35.00
Heavy breakable cast..	23.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths..	30.00-34.00

LOS ANGELES

No. 1 heavy melting...	20.00
No. 2 heavy melting...	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings.	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*42.00-44.00*

SAN FRANCISCO

No. 1 heavy melting...	20.00
No. 2 heavy melting...	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings.	5.00
Mixed borings, turnings	5.00
Short shovel turnings..	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting...	$22.00
No. 2 heavy melting...	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings....	12.00

Cast Iron Gradest

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING

1740 Benjamin Huntsman directs the casting of crucible steel ingots.

Crucible Process for Melting Blister Steel

Until Benjamin Huntsman succeeded in melting and homogenizing blister bar in a crucible, commercial tool steels were undependable. As a result, only a negligible quantity was manufactured. Nevertheless, the crucible process was the first step in the development of fine steels for the manufacture of the strong, sharp, durable tools we know today.

Modern methods reveal over 90 percent of all tool steels now made in America is melted in basic electric furnaces. The application of modern analytical chemistry in treating the charge insures further quality control. This charge is most important and consists of a high percentage of special scrap.

This special scrap requires known analysis, a problem particularly suited to our experience, personnel, equipment and the strategic locations of our offices. Possibly our facilities may help you solve a problem in iron or steel scrap.

This is the third in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.

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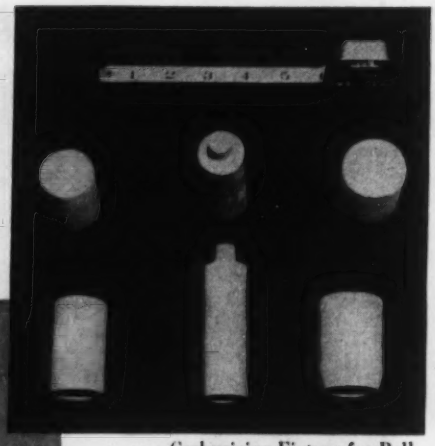
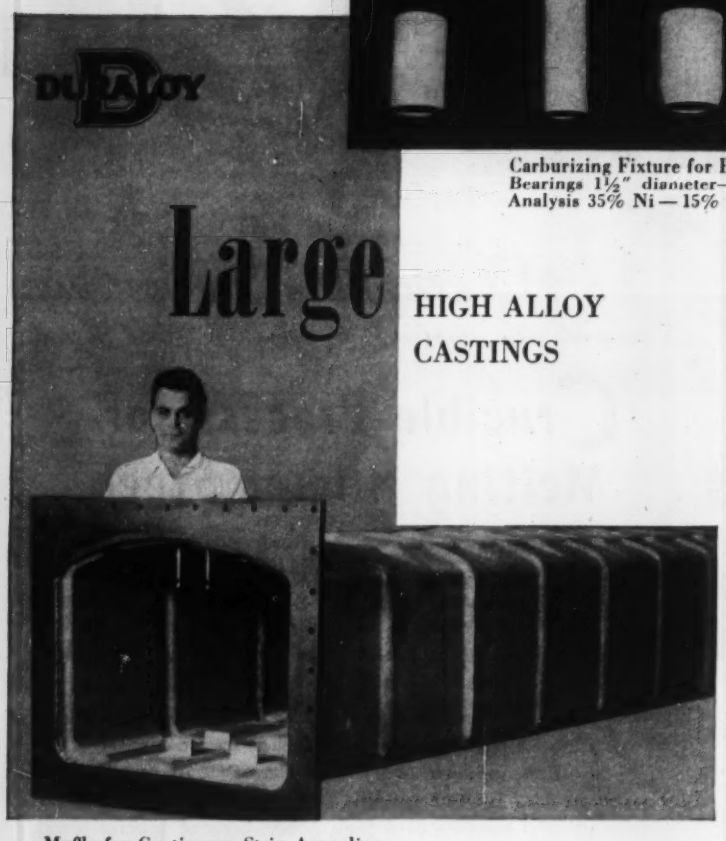
Small

HIGH ALLOY
CASTINGS



Carburizing Fixture for Ball Bearings 1½" diameter—
Analysis 35% Ni — 15% Cr



Large

HIGH ALLOY
CASTINGS

Muffle for Continuous Strip Annealing
12' 6" long — Analysis 38% Ni — 18% Cr.

LARGE or small DURALOY, can do it! These are just typical examples of the work moving through our foundry. Some of these castings are designed for heat resistance, some for corrosion resistance, some for abrasion resistance; all are cast by experienced foundrymen. All are carefully tested in our up-to-date laboratory.

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THE DURALOY COMPANY

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(*Continued from page* 151)

of scrap, constructive delivery never could be undertaken.

Steel companies invariably have reserved the right to inspect material for quality upon arrival at their plants and reject it if quality is lacking. It is doubtful if mills will surrender this privilege on material subject to delivery; so there would be a conflict with the exchange regulation on finality of inspection.

Nonprofit—The Chicago Mercantile Exchange is a nonprofit organization deriving its operating revenue from members' dues and a small fee charged for the clearing of transactions made on its floor. The exchange does not buy or sell commodities or make contracts for delivery of commodities. Prices made on its futures boards represent the forces of supply and demand, as determined by the purchases and sales of its brokers and their customers.

The exchange provides a market place where buyer and seller may meet and trade under uniform rules and regulations. It affords the opportunity to speculate on the advance or decline of prices, or to hedge a commodity inventory, or a need for inventory.

What You Buy—Trading in futures will not involve buying or selling a specific car of scrap. Rather, it will involve a contract to deliver a specified quantity of scrap in a specified month. If market conditions change before delivery time (making it advantageous to dispose of the contract) a member may sell his contract to accept delivery or buy back his contract to make delivery. This latter transaction offsets the original contract and one then is "out of the market."

Only member brokers of the exchange are permitted to make trades. For service performed, the broker is entitled to a commission of $18 a contract for nonmembers and $10 for members.

This Is a Contract—The contract will call for units of 40 gross tons of No. 1 heavy melting steel, with No. 2 heavy melting deliverable at a discount of $5 a ton. Minimum price fluctuation to be used in trading will be 12.5 cents a ton or $5 per contract.

No. 1 Steel—No. 1 heavy melting steel is defined in exchange regulations as: "Clean wrought iron or carbon steel scrap ¼-in. and over in thickness, not over 5 ft in length. Individual pieces must be free from attachments and cut to lie flat in the charging box. New mashed pipe ends, original diameter 4 in. and over, may be included. Scrap must be free from dirt, nonferrous metals, excessive rust or scale or foreign material."

No. 2 Steel—No. 2 heavy melting

CLASSIFIED ADVERTISING

Help Wanted

DROP AND UPSET FORGE SUPERINTENDENT for Southwest plant with total employed 130. Must be able to supervise and direct die making, production on board and steam hammers and upsetters producing hollow forgings. Enclose photograph, full experience with references and salary brackets in past employment. Opportunity for fully qualified applicant. Reply Box 112, STEEL, Penton Building, Cleveland 13, Ohio.

Prominent Eastern special steel maker needs SALES DEVELOPMENT METALLURGIST to concentrate on high temperature alloys and related stainless steel problems. Must travel. State age, marital status, education, previous experience and salary requirements. Reply Box 113, STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

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M.I.T. Engineering Graduate with Proven Record in Plant Supervision and Control of Related Functions Dealing with Production Planning, Tooling, Quality, Maintenance, and Industrial Engineering. Reply Box 100, STEEL, Penton Building, Cleveland 13, Ohio.

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Illinois steel boiler manufacturer wants Midwest sales representative to obtain sub-contract work. Reply Box 114, STEEL, Penton Building, Cleveland 13, Ohio.

MANUFACTURERS AGENCY

Major Midwest Drop Forging Company, with complete facilities for producing up to 400 pound steel forgings, has opening for established aggressive manufacturers agency. Reply Box 111, STEEL, Penton Building, Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N.Y.

Accounts Wanted

OHIO REPRESENTATION

Graduate Mechanical Engineer, age 37, with 15 years manufacturing experience, now established as representative, would like one additional account. Only interested in well organized and established company. Prefer production products. Reply Box 115, STEEL, Penton Building, Cleveland 13, Ohio.

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Also Screw Machine Products to Order
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Machine Screw Corp
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Makers of H & G Die Heads

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Blocks—Plates—Rounds
MOTOR & GENERATOR BRUSHES
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8" x 8" x 1" ANGLE SHEAR
L & A Model C. Double clutch. 15 H.P. motor. Guaranteed in Excellent Condition. LOW PRICE.
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Set solid	50 words or less, $15.00, each additional word .30
All capitals	50 words or less, $19.20, each additional word .38
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Address your copy and instructions to

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Penton Building Cleveland 13, Ohio

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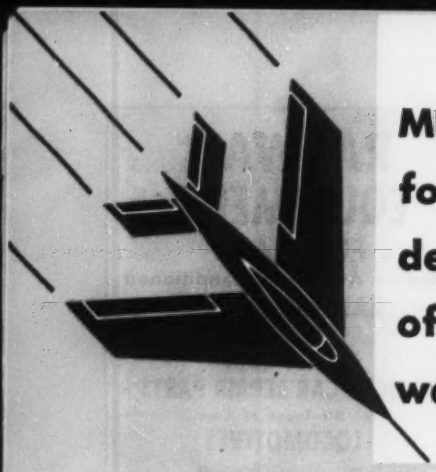
FOR USED TRANSFORMERS

Convert your used transformers to cash! Send us a description of them TODAY.
TRANSFORMERS AND COILS BUILT TO YOUR SPECIFICATIONS.
Send blueprints for prompt quotation.
TRANSFORMERS BOUGHT, SOLD AND REPAIRED
40 Years of Dependable Service

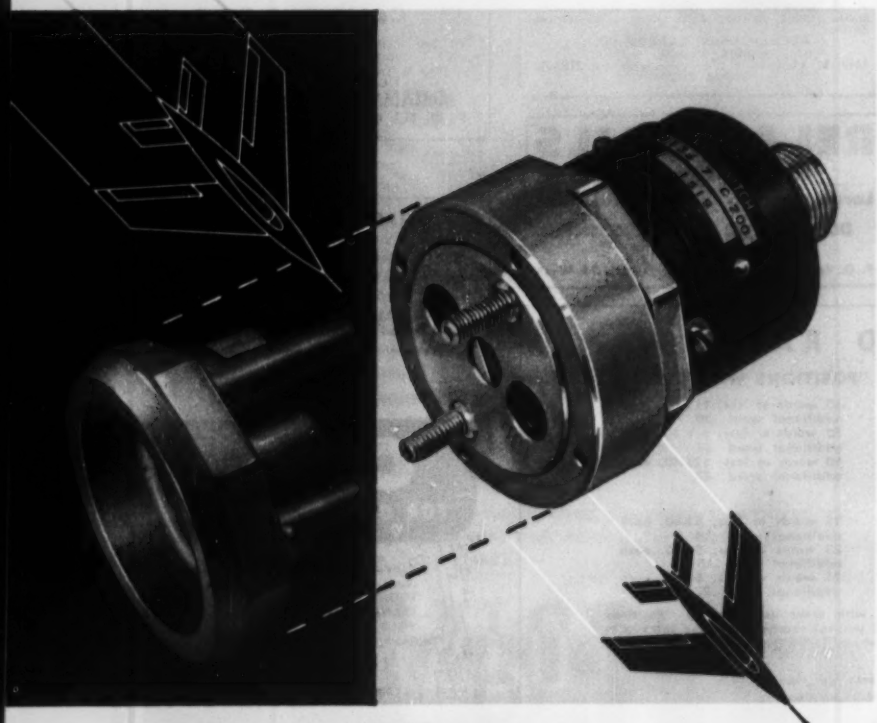
THE ELECTRIC SERVICE CO.
5315 Hetsel St., Cincinnati 27, Ohio



MUELLER BRASS CO. forgings help insure dependable operation of aircraft pressure warning instruments

A specially designed housing, accurately forged to customer specifications by Mueller Brass Co., seals in the diaphragm of the pressure warning unit manufactured by Eclipse-Pioneer Division of Bendix Aviation Corporation in Teterboro, New Jersey. The unit, designed for installation in fuel, oil, water or alcohol lines of modern aircraft is a highly sensitive instrument that instantly warns the pilot or flight engineer of any unusually high or low fluid pressures.

All Mueller Brass Co. forgings have a dense, close-grained structure with a high tensile strength. Weight savings up to 40% are possible in the design of parts because of the close tolerances to which they can be produced. Less scrap and longer tool life result from the easy machinability of forged parts. Mueller Brass Co. is completely equipped to design parts for your products, specify alloys (including special alloys developed by our metallurgists), forge, machine, finish and plate the parts and perform all necessary assembly operations. Write today for our free illustrated 32-page forgings catalog and complete information about MBCo forged parts for your products.



MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

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steel is defined as: "Clean wrought iron or carbon steel scrap ⅛ in. and over in thickness, not over 18 in. in width and not over 3 ft in length. May include up to 5 per cent galvanized material. Individual pieces must be free from attachments and cut to lie flat in the charging box. Pipe cut 3 ft and under may be included. No automobile body and fender stock may be included. Scrap must be free from dirt, nonferrous metals (except galvanized materials as limited above), excessive rust or scale or foreign material."

Scrap . . .

Scrap Prices, Page 152

Philadelphia—If domestic steelmaking activity continues upwards, scrap shortages could materialize. At the present rate of operations coupled with ample mill stocks and disinterest of scrap buyers, such a situation seems somewhat remote. At least a quarter-million tons of scrap already have been assured of leaving the country and the total could aggregate a half-million tons. Shutdown of automotive assembly lines for model changeovers will cut off much production scrap and force more dealers' scrap into circulation.

Youngstown—On a sale to a major consumer in the Valley, prices advanced here on top grades which are in tight supply.

Pittsburgh—No. 1 heavy melting scrap demand is dull. A sizable order of cast iron scrap brought a price of $36-$37 to No. 1 cupola, an increase of $2 a ton.

Chicago—Some degree of price stability in steelmaking scrap is indicated with a leading mill reaffirming the present market for its September acquisitions.

Detroit—Scrap prices remain unchanged. Previous feeling that prices might drop due to reduced steel output has been canceled by the reduced amount of scrap generated.

Birmingham—Scattered buying of relatively small lots is noted in the scrap market. Considerable melting steel is moving to seaports.

St. Louis—Railroad grades of scrap are getting mill preference, with the result prices are higher on rerollers, random lengths and angles. Dealer grades remain soft.

San Francisco—A shipload of steel scrap will depart this week for Japan. Prices are stable.

Los Angeles—Cast steel scrap market has softened with resumption of single shifts by foundries in this district. For several weeks, foundries have been operating double shifts, consuming large quantities of No. 1 cupola cast at $44.

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Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Rolling Mill Equipment

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.

Bar Mills
Merchant Mills
Sheet and Strip Mills
Pinion Stands
Roller Tables
Reduction Drives
Stretcher Levellers
Guillotine Shears
Sheet Mill Shears
Roll Lathes
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Machine Work

Hyde Park

FOUNDRY & MACHINE CO.

Hyde Park, Westmoreland County, Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

Tests for Determining Mechanical Properties of Alloy Steels

This is the sixth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

The types of tests used to evaluate the mechanical properties of an alloy steel depend upon the end use of the steel involved. Generally speaking, mechanical properties are determined by tension, bend, and hardness tests, and by a group of special tests employed on tubular and wire products. These are discussed briefly in the following paragraphs.

(1) Tension tests provide means of determining tensile strength, yield point, yield strength, proof stress, proportional limit, per cent elongation, and per cent reduction of area. This sort of test subjects the steel to stresses resulting from the application of an axial tensile load to the specimen ends, the load being sufficient to rupture the specimen.

(2) Bend tests often aid in determining the ductility of steel. The severity of such a test depends largely upon the bending radius used. Several factors influence the length of radius, including thickness of the test specimen, width of test specimen, direction of test, chemical composition, tensile strength of specimen, etc.

(3) Hardness tests determine the steel's resistance to penetration. This characteristic is most commonly measured by the Brinell Test or the Rockwell Test. In the former, pressure is applied to the surface of a test specimen by means of a ball 10 mm in diameter. Two diameters of the resulting impression are measured and averaged, the average being used to determine the hardness number by means of a conversion table. In the Rockwell Test, the degree of hardness is read on a gage; hardness is measured by the penetration of a diamond point or a $^1/_{16}$-in. steel ball. Rockwell "C" scale readings are used in connection with the diamond point; "B" scale in connection with the steel ball. The "C" and "B" are the most commonly used of the several Rockwell scales.

(4) Special additional tests are often made on tubular and wire products. These include such items as hydrostatic and manipulating tests, and torsion and wrapping tests, the latter two being used only with wire.

The subject of testing and its relationships to the end uses of alloy steels has been given broad study by Bethlehem metallurgists. If you desire, they will be glad to discuss any phase of it with you, and also give unbiased opinions on such matters as analysis, proper selection of steels, machinability, etc. Call for their services at any time.

And when in the market for alloy steels, remember that Bethlehem can furnish the entire range of AISI standard analyses, as well as special-analysis steels and all carbon grades. Your inquiries will be welcomed.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL

• **WORM GEARING**—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

CLEVELAND-driven processor feeds and levels strip

IN the continuous pickling line at Youngstown Sheet and Tube's new cold reduced sheet mill at Indiana Harbor, this processor levels out the bulges and feeds hot rolled strip to the next station. Efficient performance of both jobs depends largely on the Cleveland drive. Operating from a motor and gear box, the Cleveland worm gear speed reducer drives both tension and leveler rolls of the leveler with a smooth, quiet, steady, torque flow. Ratio is 30:1.

Through 40 years Clevelands have demonstrated the inherently high shock load resistance of quality worm gearing. Worm action on gear teeth is such that, even when severely over-loaded, the danger of sudden failure is remote.

When you install a Cleveland you can be sure you are investing in the finest, most dependable worm gear drive to be had. Write for free Catalog 400. The Cleveland Worm and Gear Company, 3270 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
WORM GEAR
Speed Reducers

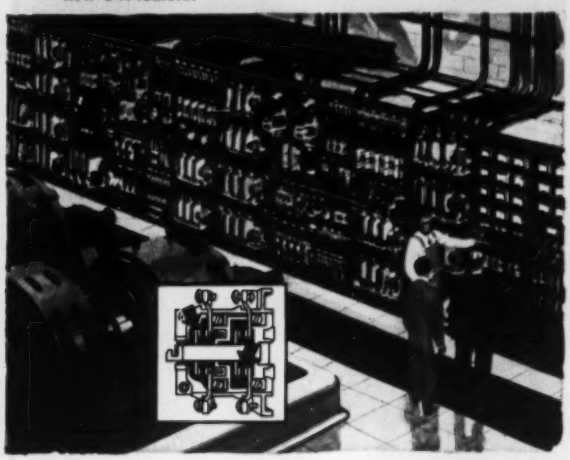
THE THREE CUTLER-HAMMER STARS
★ ★ ★
STAND FOR THREE NEW STANDARDS

Rolling bearing action...

The proper performance and useful life of all modern machines demand anti-friction bearings. Motor control is no exception; it too must have good bearings to avoid wear and trouble.

Dust-safe vertical contacts...

Experienced engineers *know* vertical contacts work better and last longer because they stay clean, shed dust, do not collect it. Pressure arc quenching is important new C-H feature.



☆ *installs easier*
☆ *works better*
☆ *lasts longer*

Less bounce by the ounce...

Research showed contact bounce caused arcing, that reduced weight in moving contact members cut bounce and arcing. So new light-weight parts now remarkably lengthen contact life.

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